This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

**Usage guidelines**

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

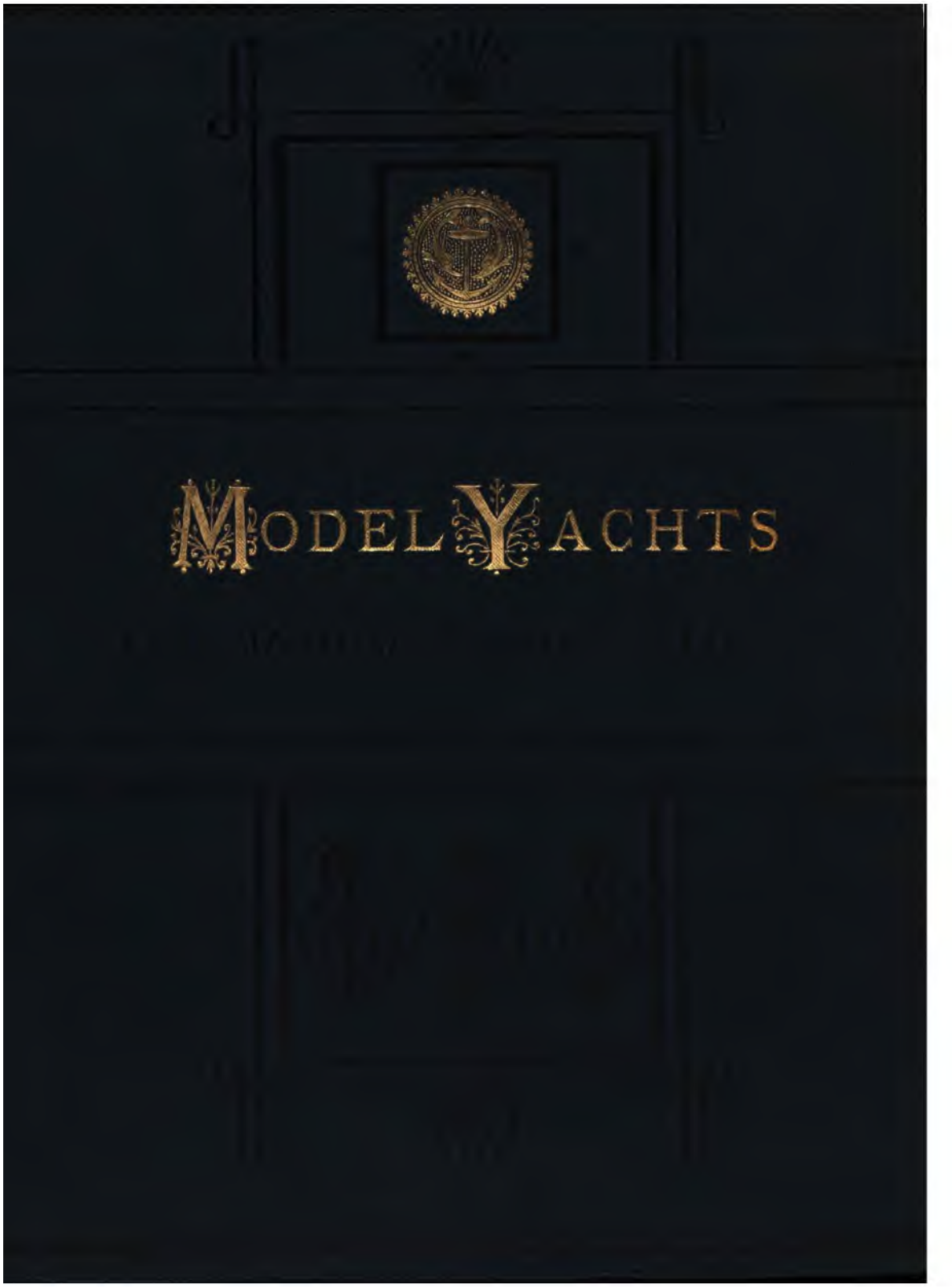
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

**About Google Book Search**

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`


MODEL YACHTS

600082042M

# MODEL YACHTS AND MODEL YACHT SAILING.

# BOOKS OF INSTRUCTION AND AMUSEMENT.

## *THE BOY'S OWN TOY MAKER:*

A Practical Illustrated Guide to the useful employment of Leisure Hours. By E. LANDELS. With 200 Cuts. Ninth Edition. Price *2s. 6d.*

"A new and valuable form of endless amusement."—*Nonconformist.*

"We recommend it to all who have children to be instructed and amused."
*Economist.*

## *THE GIRL'S OWN TOY MAKER*

### AND BOOK OF RECREATION.

By E. and A. LANDELS. With 200 Illustrations. New Edition. The Eleventh Thousand. Just ready. Price *2s. 6d.*

"Contains a large number of engravings, and gives instruction, with many examples, how to make Paper Toys, &c., &c., in which young people especially take interest."—*Leeds Mercury.*

"Within the past few years great advancement has been made in the educational system it is meant to encourage, and it is, therefore, all the more likely to obtain a still wider circulation."—*Edinburgh Daily Review.*

"Capital little volume . . . will be found a rare prize for families."—*City Press.*

"We can easily imagine the delight with which a family of children would welcome this interesting work."—*Scholastic World.*

## THE ILLUSTRATED
## *PAPER MODEL MAKER;*

Containing Twelve Subjects and Practical Diagrams for their Construction, in an Envelope. Price *2s.*

GRIFFITH & FARRAN,

WEST CORNER OF ST. PAUL'S CHURCHYARD, LONDON.

E. P. DUTTON & CO., NEW YORK.

SAILS. *a a* mainsail.
*b b* topsail.
*c c* foresail.
*d d* jib.

MASTS { *a* mainmast. / *b* topmast.
*c* bowsprit.
*d* main boom.
*e* gaff.
*f* foresail boom.
*g* jib boom.
*h* bobstay.
*i* mainrigging (port or left side).
*j* hull.
*k* false keel.
*l* lead keel.
*m* counter.
*n* sternpost.
*o* stem.
*p* self-acting rudder, only used when running.

LATERAL VIEW OF 3-FT. YACHT ($\frac{3}{8}$ inch to the foot).

*For deck outline and measurement of this Model "Diana" Cutter, see diagram* 8, *p.* 19.

# MODEL YACHTS

# AND MODEL YACHT SAILING.

*HOW TO BUILD, RIG, AND SAIL*

*A SELF-ACTING MODEL YACHT.*

BY

JAMES E. WALTON, V.M.Y.C.

ILLUSTRATED WITH FIFTY-EIGHT ENGRAVINGS.

GRIFFITH AND FARRAN,

SUCCESSORS TO NEWBERY AND HARRIS,

WEST CORNER OF ST. PAUL'S CHURCHYARD, LONDON.

E. P. DUTTON AND CO., NEW YORK.

MDCCCLXXX.

[*The rights of Translation and of Reproduction are reserved.*]

# CONTENTS.


PAGE

PREFACE . . . . . 11

INTRODUCTION . . . . . 15

CHAP. I. PRINCIPLES OF SELF-ACTING MODEL YACHT BUILDING . . . . . 21

„ II. HOW TO MAKE THE HULL . . . . 31

„ III. HOW TO MAKE DECK FITTINGS, RUDDER, &c. . 47

„ IV. HOW TO FIT MASTS, STANDING AND RUNNING GEAR, &c. . . . . 57

„ V. HOW TO MAKE THE SAILS AND SET THEM . 73

„ VI. HOW TO SAIL AND STEER A MODEL YACHT . 85

MATERIALS FOR MODEL SHIPS . . . . . 97

GLOSSARY . . . . . 100

MODEL YACHT CONTESTS ON THE SEA . . . . 102

TABLES OF MODEL YACHT REGATTAS . . . . 103

WATERS IN LONDON FOR MODEL YACHT SAILING . . 104

# PREFACE.

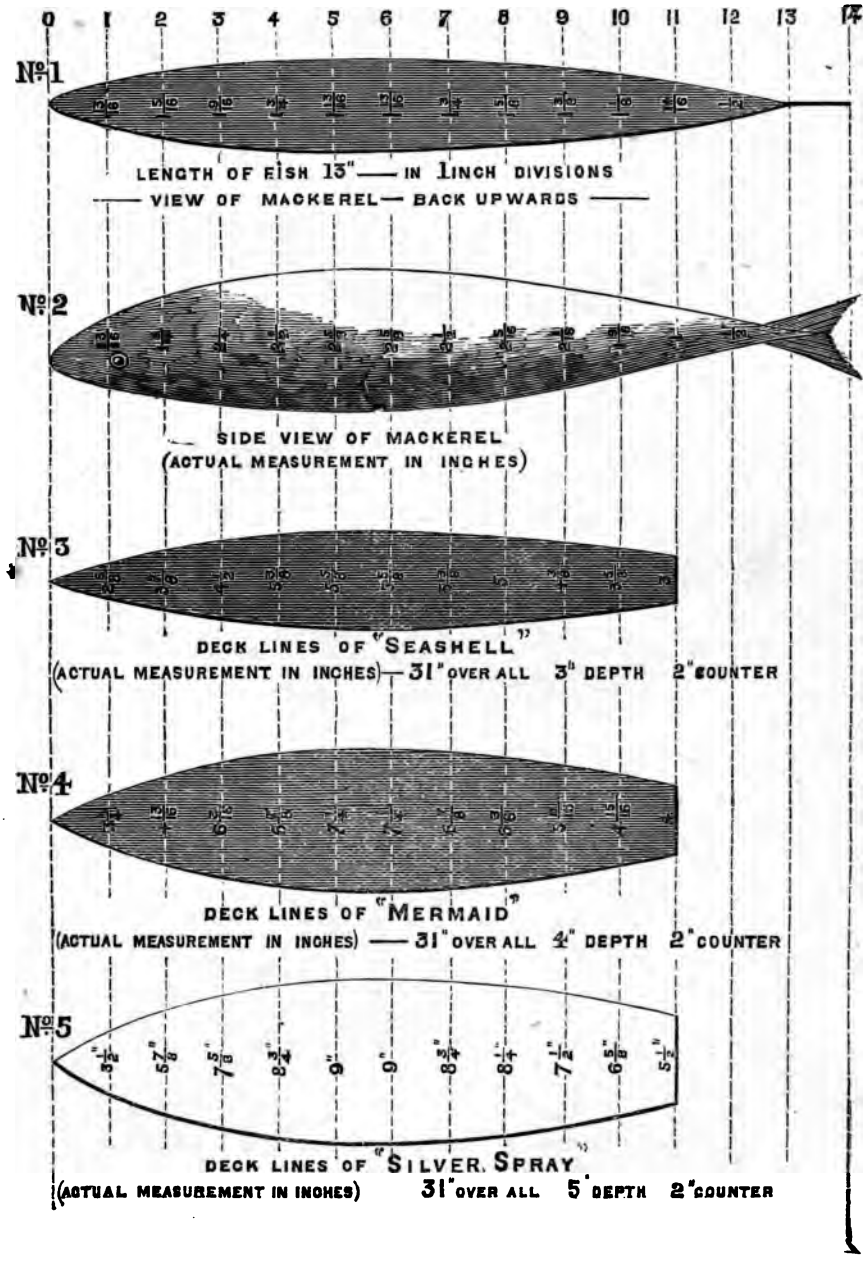
THERE are not many open-air amusements which afford more genuine enjoyment to old and young than Model Yacht Sailing; if practised in a properly scientific manner it resembles a game of croquet, in which the water is the lawn, the wind the mallet, and the ships the balls; and the most skilful yachtsman is as certain of winning his match as is the most skilful croquet player.

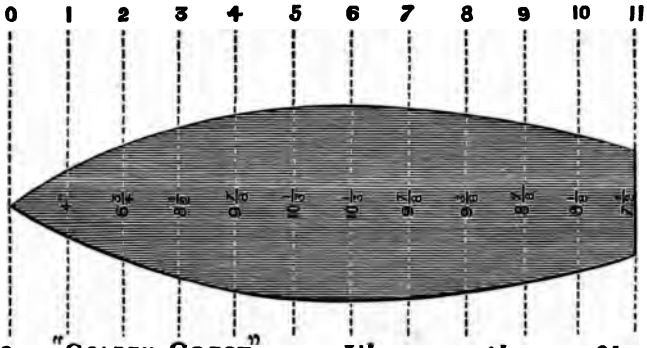
Very few English boys can be found who have not taken, or do not take an interest in model ships, and it is very remarkable, as well as no little disgrace to us as a maritime nation, to note the utterly purposeless way in which nearly all boys or men sail their model vessels; whereas with the requisite knowledge, a self-acting model yacht is as much under the control of the manager as if he were actually on board: further still, matches can be sailed in which the

# MODEL YACHTS AND MODEL YACHT SAILING.

20 lbs., a 2-ft.-6-in. boat 10 or 11 lbs., and a 24-in. boat 6 lbs. or nearly.

I will note here that it is better to make a vessel scooped out, &c., from the solid block, than to build one of small planks; 1st, it is easier (it takes a good carpenter to make one of planks), it can be altered outside if not scooped out too thin at first, it never *leaks*, and it never comes to pieces; and, lastly, it does not take half the time to repaint, &c., &c.

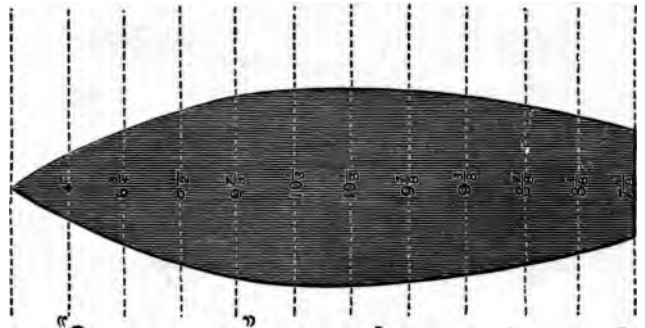

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
No 1
LENGTH OF FISH 13" — IN 1 INCH DIVISIONS
— VIEW OF MACKEREL — BACK UPWARDS —
No 2
SIDE VIEW OF MACKEREL
(ACTUAL MEASUREMENT IN INCHES)
No 3
DECK LINES OF "SEASHELL"
(ACTUAL MEASUREMENT IN INCHES) — 31" OVER ALL 3" DEPTH 2" COUNTER
No 4
DECK LINES OF "MERMAID"
(ACTUAL MEASUREMENT IN INCHES) — 31" OVER ALL 4" DEPTH 2" COUNTER
No 5
DECK LINES OF "SILVER SPRAY"
(ACTUAL MEASUREMENT IN INCHES) 31" OVER ALL 5" DEPTH 2" COUNTER




№ 6.

DECK LINES — "GOLDEN CREST" —— 31" OVER ALL 4" DEPTH 2" COUNTER

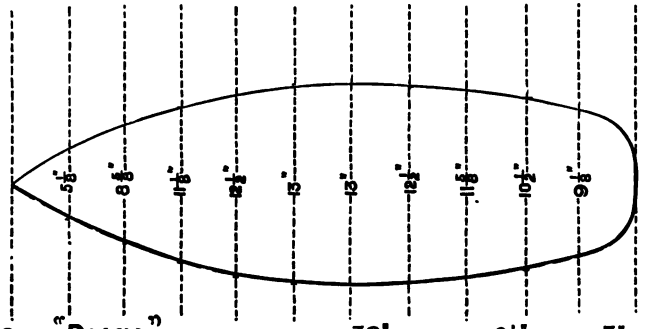
(ACTUAL MEASUREMENT)



№ 7.

DECK LINES — "STORM ALONG" —— 31" OVER ALL 5" DEPTH 2" COUNTER

(ACTUAL MEASUREMENT)




№ 8.

DECK LINES — "DIANA" —— 39" OVER ALL 6½" DEPTH 3" COUNTER

36" WATER LINE OR LOAD LINE

# CHAPTER I.

## PRINCIPLES OF MODEL YACHT BUILDING.

# CHAPTER I.

## PRINCIPLES OF MODEL YACHT BUILDING.

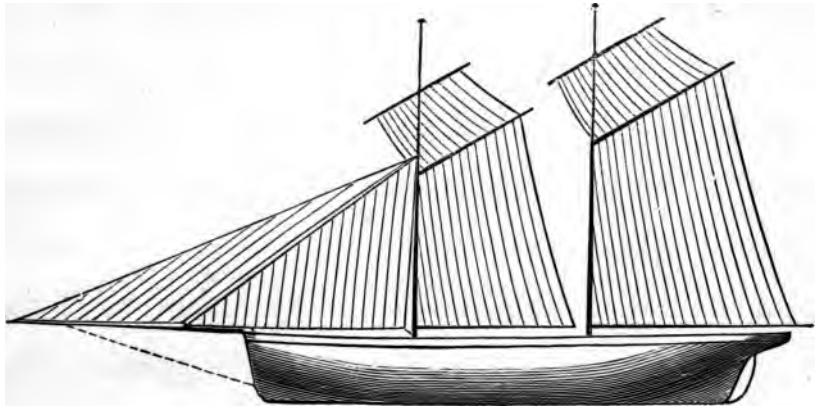
In order to ascertain the best lines, *i. e.* shape, for progression through the water, Nature herself may, without hesitation, be taken as the best teacher, and amongst fast-moving fishes a mackerel is one of the fastest and most graceful.

I procured a mackerel, carefully measured and drew it to scale (see p. 17, diagrams 1 and 2), first taking the shape back upwards, and next sideways, and in harmony with these lines all the vessels mentioned in this work are constructed.

On looking at the diagram of the mackerel it is at once apparent that a clean run is more important than a sharp entrance, for the drawing shows the fish to be much fuller in the fore than in the after part; bearing this in mind, and having drawn the mackerel in

divisions of inches, I took the forward eleven divisions as a model for the deck and general lines of my vessels —first, so far as regards "*going through the water;*" secondly, because I should thus get "*the widest part or beam amidships,*" and as near the centre of motion and gravity as possible.

With these ideas in my mind I constructed "Sea-shell" (see diagram 3, p. 17), with the actual measurements there stated (as is the case on all the drawings). I rigged her as a schooner; thus—



She sailed well and steadily, and could be made to go in any direction in a light breeze, but her *narrow beam*

*and lightness*, with only 3 lbs. keel, rendered her useless in a stiff breeze, except when she was running away from it.

I next built "Mermaid" (see diagram 4), with nearly 2 in. more beam, and exactly to the measurement of the mackerel sideways, simply increasing each line in proportion as the ship was larger than the fish; all the lines of the hull being of course in harmony with the increased beam, she had 5 lbs. lead keel, and was rigged as a cutter (see "Diana" for cutter rig, frontispiece), schooner, or lugger at pleasure. I found she beat "Seashell" considerably in any wind, but especially in strong winds, sailing under any of the above-mentioned sails.

Learning by this that increased beam and weight meant more power, more sail, and greater speed, I then made "Silver Spray" (see diagram 5), with 8 lbs. keel, and nearly 2 in. more beam than "Mermaid," and in this vessel I reached about the proportional beam that most model yacht builders have adopted, viz. 3½ beams

to the length. I rigged her as a cutter only, and she easily beat "Mermaid" every way. I also discovered that cutter rig was best, the boats under this rig sailing faster and truer, and are more quickly and expeditiously managed; at the same time I discarded fixed rudders for reasons stated before.

With this model, "Silver Spray," I had reached a point at which I stuck for some time; I could hardly think still increased beam or depth would be an advantage, yet I wished to progress, and try something I would.

I thought the matter over carefully, and at last arrived at the following conclusions: A fish goes *through the water only, but a ship goes through and over.* Now a duck goes over the water; how would a vessel built upon a combination of fish and duck succeed?

I got a duck, took a plaster cast of his under side, noticed the way ducks got over the water, the resistance of the water and the ripples and wake caused by the

duck's motion over the water, and I decided to make a ship to go *over the water rather than through it;* the top of the *water is alive*, and easily displaced in any direction save downwards, the deeper one goes the stiller it is, and the more difficult to displace. I considered, therefore, if I built a vessel of greater beam, very light draught of water, with a lead keel well below the bottom, I should get greatly increased power and speed, for I felt satisfied that the light draught and larger sails more than compensated for a wider beam.

It stands also to reason that a vessel of a wide beam does *not heel over to leeward* so much as one of a narrower beam, and it results from that—1st, the sails being more perpendicular to the wind, have more power to propel; and 2nd, the keel being also more "up and down," prevents her making so much leeway.

No doubt there is a limit to breadth of beam, and although I have not yet fully experimented, I am inclined to think that the limit is reached in "Diana," of three beams to the length.

On this I built "Golden Crest" (see diagram 6, p. 19), with these qualities, beam 10⅓ in., or ⅓ her length exactly, and only a bare 4 in. depth, and 10 lbs. lead keel; I fitted her with sails as a cutter, making them larger than those of "Silver Spray," in proportion to her increased beam and ballast (in lead keel), and she more than fulfilled my utmost expectations, for she beat all the three former models out and out, both in speed and steadiness.

Still, however, I had not quite finished my experiments, for I remarked that in strong winds "Golden Crest," on account of her low freeboard (*i.e.* little height out of the water), was sometimes overpowered sooner than I thought she ought to be, and I determined to build another vessel on the same lines and of the same size exactly, but with 1 in. deeper hold; this I did in "Storm Along" (see diagram 7, p. 19), the only difference between this and "Golden Crest" being the 1 in. extra depth of hold; lead keel, sails, masts, &c., &c., all were exactly the same.

Now, when Greek meets Greek, then comes the tug of war. So it was here, and it was only after numberless trials in all winds, and finally by actually interchanging their sails, that "Storm Along" proved the winner; the reason this was difficult to establish was that at first I only sailed *each with its own sails;* when the wind was moderate and sea smooth, "Golden Crest" won a little; on the other hand, with strong breezes and sea on, "Storm Along" won. I interchanged their sails, and "Storm Along" won considerably always. I then found out that I had happened to lace the feet of the sails of "Storm Along" to their booms, but it never struck me such a trifle would interfere much with the sailing of a model: I was mistaken, however, for I found whichever had the laced sails was sure to lose, and "Golden Crest" lost most; mind, all these experiments were conducted on the open sea for hours, with true winds and true sea (the most perfect test). I cut the sails loose, and at once and ever after, "Storm Along" proved invariably the

victor; in light winds by very, very little, but in strong winds the greater buoyancy, and therefore lateral power, of "Storm Along" always carried the day.

With all these ships there are *no bulwarks*, no ornaments, or projections of any kind, nothing but the gear, &c., necessary to set the sails and work them; everything else is not only useless, but mischievous lumber.

It may be remarked that the whole of those boats when running before the wind, with self-acting lead rudders, run at very nearly the *same speed*, length to a great extent governing speed; but on turning to windward, each falls into its place, as assigned to it in the foregoing pages.

I have not yet tried whether greater beam still than ⅓ the length is an improvement; I am resting on my oars awhile, and perhaps some one else may undertake the experiment.

Particulars of the races between "Golden Crest" and "Storm Along" are noted on p. 102.

## CHAPTER II.

# HOW TO MAKE THE HULL.

## CHAPTER II.

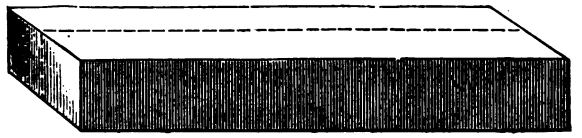
### HOW TO MAKE THE HULL.

BEFORE entering upon the subject of this chapter, I will enumerate the tools which will be needed : these are a small axe, saw, plane, 1-in. gouge, ½-in. gouge, a rasp, a bradawl, a screw-driver, a gimlet, a hammer, a pair of small round-nosed pliers, a rat-tail file, a half-round file, a small mallet, and last, though not least, a good pocket-knife.

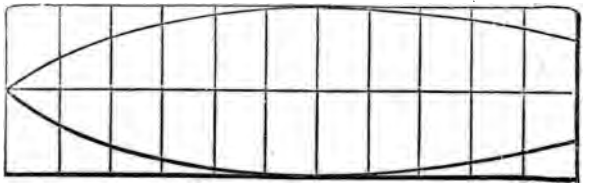
It is best and easiest, at any rate for beginners, to cut out model ships from a solid block, because if not scooped out too thin, alterations can be made on the outside if desirable; if the block, in process of cutting out, should split, rub it with a piece of flannel dipped in linseed oil every time after working on it, the tools cut just as easily, and all liability to split is obviated.

To make a 3-ft. yacht (see lateral view, frontispiece;

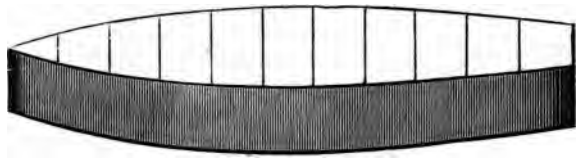
deck outline, diagram 8, p. 19; and sectional outlines, p. 37), get a block of deal, with as few knots and cracks in it as possible, and well-seasoned; it must be 39 in. long, 13 in. wide, and 8 in. deep; thus—

A 

Divide it into two exact halves, as shown by the dotted line—this centre line must *never be lost* or *rubbed out till the hull is finished;* choose the best side for the deck or upper side, divide it lengthways into eleven compartments or divisions, and carefully set off on each side the length of each line (as shown in diagram 8, p. 19); thus—

B 

With the axe (mind all the tools are sharp) chop off carefully both sides of the block till it is shaped thus—

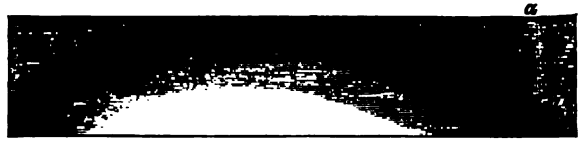
C 

With the gouge cut out the run and entrance in the bottom of the piece of wood, beginning a little forward of the middle for the run; and at same time cut away so much of the bottom as will leave ½ in. for the keel, by ⅝ wide. The next diagram shows one side, with entrance and run cut out.

D

Having cut out the other side to *correspond exactly*, and rounded the sides and bottom with the plane and rasp, taking care all the curved parts are in keeping with the curves of the deck diagram C, saw a slanting piece off the cutwater, about ½ in. at bottom to nothing at top, measure 36 in. from the middle of

the cutwater towards the stern, and cut out the piece of keel in the run, so as to leave the counter (projecting of the stern); thus (the dotted lines show where and how to cut)—

E 


The counter must not project more than 3 in., and therefore the ship will be 3 ft. keel, and 3 ft. 3 in. over all. Now smooth and model the ship to your best ability, see the keel *is quite straight*, and the *sternpost perpendicular to the stempost or cutwater* (*a a* is the sternpost in above diagram E).

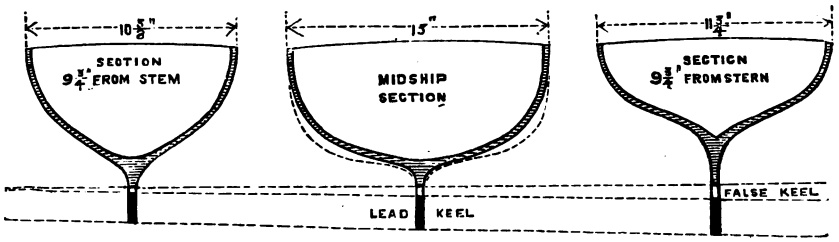
If the vessel is now exactly equal on both sides, and not lob-sided, as sailors call it, you can finish it with the rasp, scrape it with glass, and polish it with sand paper, making the outside look perfectly ship-shape.

The sectional views here shown enable the model ship builder to judge of the correctness of his work; they represent the hull *when finished*, if cut athwart or across

into four pieces of equal length, and by holding the vessel in the required position the builder can see if his model present these or nearly these outlines exteriorly; if so, it is right.

It is not at all necessary to adhere exactly to this outline of the midship section (although it governs the outlines of the other two); it may be cut somewhat flatter on the bottom, as indicated by the dotted lines, and this would of course slightly vary the other sectional outlines, but I do not think it should be made more angular, nor do I advise it, as the vessel would lose too much buoyancy.

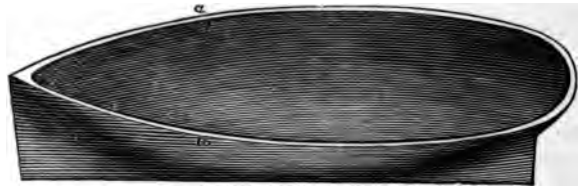
SECTIONAL VIEWS.



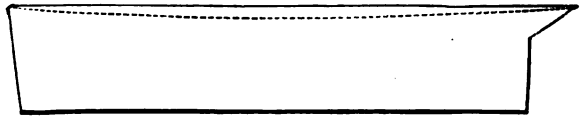

The next thing is to scoop it out with the gouge and mallet. Leave the sides everywhere ⅜ or ½ in. thick,

and be careful not to scoop thinner, or leave the sides thicker in one part than another.

The gouge is the principal tool for this work, but a centrebit, to bore holes all over the inside, is a great assistance, it saves half the hammering; however, when scooped out and the inside smoothed, your vessel should look thus—

F 

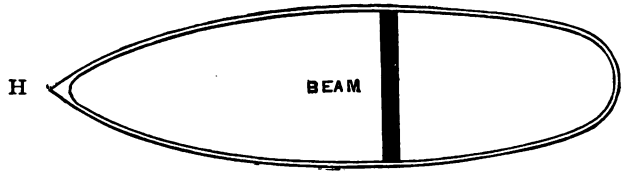
Next make the *sheer* by planing out the gunwale (gunwale *a a*), beginning at nothing forward at the stem, gradually increasing to ½ in. amidships, and again decreasing to nothing at the stern. The diagram G below shows clearly what is meant by the sheer, and how to fashion it: the dotted line is the sheer—

G 

and a vessel looks very stiff and ungraceful without it.

Now give the inside a coat of white paint, and then the deck can be put on. The deck must be made of one piece of deal plank, without splits or knots, ¼ in. thick at the sides, and ⅜ in. in the middle; this gives the deck a slightly rounded appearance, and, besides, greatly strengthens it. Mark the shape of the gunwale on the plank by turning the ship bottom upwards upon it, and marking it round with a pencil; draw a middle line from end to end, and cut it to the required shape as near as possible.

A beam must now be put across the middle of the ship, exactly level with the gunwale on both sides, to support the deck and strengthen the sides of the ship; the beam should be ½ in. square; thus—




Screw the sides of the ship to the ends of the beam; then put on the deck, and screw it to the gunwale all round with ½-in. brass (everything must be brass except

the lead keel) screws at about equal distances of 3 in., and two or three screws through the deck into the beam; if this is done in a workmanlike way, and the edge of the deck planed off and smoothed level with the side of the ship, the hull ought to be perfect, and practically water-tight. Mind in putting in the beam to leave place for the hatchway or step of the mast.

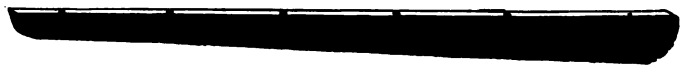
The next operation is to put on the keels—false and leaden. The false keel is simply a strip of beech, oak, or mahogany, of the same length as the keel of the ship, $\frac{5}{8}$ in. thick, $\frac{1}{2}$ in. deep at one end, and 1 in. at the other; thus—

This must be screwed into the keel of the ship with brass screws of proper length, *i. e.* not to go through the bottom of the ship, about 6 in. apart. This false keel, and the position it occupies, can be easily seen in the drawing of "Diana," and is marked K; the leaden keel is underneath as there shown, and I will now describe the best way to make it.

20 lbs. of lead will be required for a 3-ft. yacht, as before stated, and the lead can be melted in any old pot, on any ordinary clear kitchen fire. First make an oblong narrow box or mould of any smooth ½-in. boards —*dry*, or the lead will splutter and be full of air-holes —3 ft. long inside, ⅝ in. inside width, 2 in. deep at one end, and 3 in. at the other; this will hold about 20 lbs. of lead, and here follows a drawing of the mould.

Into the bottom of this mould, and sticking upright, as shown in the drawing, must be placed at equal distances six or eight pegs, beginning about 1 in. from the extreme ends of the mould; these pegs must be rather thicker than the screws intended to screw the leaden to the false keel, and will, as no doubt the intelligent reader already perceives, leave holes in the cast leaden keel for the screws to go through, these screws may be long enough

to go through the false keel into the ship's bottom, and the work will be all the stronger and better. Having melted the lead, pour it at once into the mould, and the keel is made; when cool take it out of the mould, trim it, smooth the sides and top and bottom with the plane, and let the shape be something thus—

J 

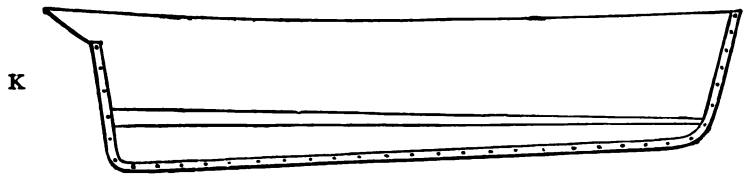
Screw it on to and through the false keel (if you cannot make holes through the false keel to receive the screws without danger of splitting it, bore them in their proper places with the bradawl, and then burn them out with a red-hot skewer); the thickest end of the keel must be aft or behind, and when screwing it on mind and bore out the top of the holes in the lead, so that the heads of the screws may be quite level with the lead (this operation is called countersinking the screws); the heaviest end of the lead is put aft so as to make the ship well up at the stem and deep at the stern;

the reason for this will be given in the chapter on "sailing a model yacht."

It may, however, be well to add here that the false keel, by holding the leaden keel at a greater distance from the bottom of the ship, greatly increases the *leverage of the leaden keel without increasing the weight*, and gives great hold upon the water, however little water the hull may draw, so that more sail can be carried, and the ship steer better with this arrangement than without it.

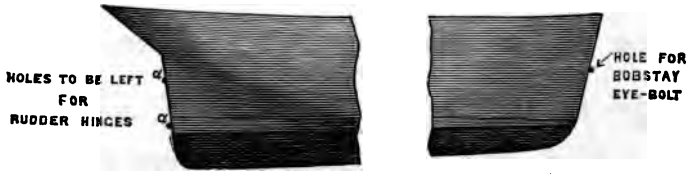
Now try how she floats, and if she floats about 3 in. deeper aft than forward, that will do.

Next get a strip of sheet brass about 5 ft. long, ½ in. wide, and ⅛ in. thick; most likely you will have to get this soldered in two or three pieces; it is to make a band to cover the leaden keel at the bottom, ends, and also the stem and sternpost, to keep them from being injured by stones, &c., on striking the shore, &c.; holes must be punched in it at every 3 in. where it covers the lead, and at every inch where it covers the wood of the stem and sternpost.




The above drawing shows what is meant, and the place it occupies (I have distorted the drawing to show it better); it must be screwed with brass ½-in. screws, countersunk, to the lead keel, &c., as above stated; the cutwater part of it must be filed away to ¼ in. wide, the rest may be left ½ in. wide. This has always been to me the most difficult operation, and it must be well done and put on perfectly straight at bottom and both ends.

When screwing it on leave one hole without screw in the stem for the bobstay, and two in the sternpost for the self-acting rudder, as shown in this drawing.




The one in the stem must be about 5 in. from top, and

the two in the sternpost about 5 in. apart—the black dots show the places.

The hull is now finished; next scratch the deck with straight lines ½ in. apart from stem to stern to imitate planks, leaving ½ in. margin all round to look like a gunwale, and with the following remarks I will close this chapter.

It must be understood that it is almost impossible to mention every operation; many things, and the way to do them, must be left to the ingenuity and skill of the builder; it is sufficient that if my directions have been reasonably carried out, the result, so far, will be a good seaworthy model yacht's hull.

I have given in this chapter and elsewhere the dimensions for a 3-ft. boat, because it is easier to work downwards from a large size than upwards from a small one. There is less chance of mistake, for an error in a 2-ft. boat would be multiplied by working upwards, while the same error would be decreased in working downwards.

A 3-ft. boat is somewhat large and heavy; 2 ft. and

2 ft. 6 in. are the best sizes. Indeed, unless a large boat is specially required, beginners should not attempt anything larger than a 2-ft. boat, and even a boat 1 ft. 6 in. is a very good size for boys, and will sail, &c., as well as a 3-ft. boat, though of course not so fast.

I append tables of measurement for the blocks of wood and weight of keels for all these sizes :—

| | | |
|---|---|---|
| For 3-ft. boat, block | 39″ × 13″ × 8″, | keel 20 lbs. |
| „ 2-ft.-6-in. boat, „ | 32½ × 10⅝ × 6⅔ „ | 10 „ |
| „ 2-ft. boat, „ | 26 × 8⅔ × 5⅓ „ | 7 „ |
| „ 1-ft.-6-in. boat, „ | 19½ × 6½ × 4 „ | 3 „ |

It would not matter if in the large sizes the keel were a pound or so heavier, and in the small a half-pound or so; but on no account must they be lighter in any case. I also add the weight of the leaden rudders necessary to make the vessels run before the wind.

| | |
|---|---|
| 3-ft. boat requires | 1¼ lbs. |
| 2-ft.-6-in. boat „ | ¾ „ |
| 2-ft. boat „ | ½ „ |
| 1-ft.-6-in. boat „ | ¼ „ |

For the masts, sails, and tackle of smaller boats, the calculation of size may be easily made.

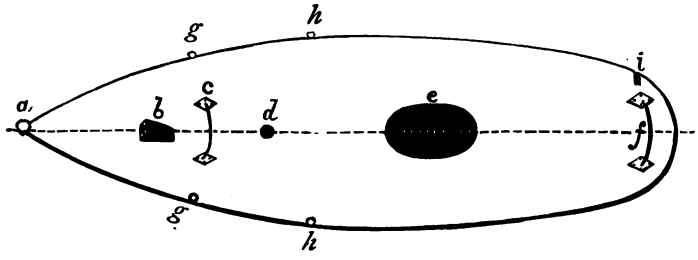
## CHAPTER III.

# HOW TO MAKE DECK FITTINGS, RUDDER, &c.

# CHAPTER III.

## HOW TO MAKE DECK FITTINGS, RUDDER, ETC.

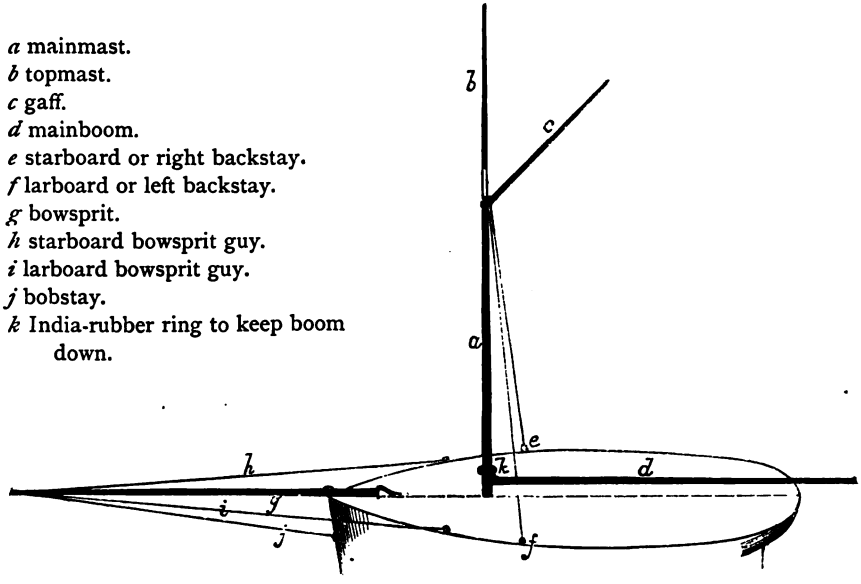
I PURPOSE in this chapter to show how to make and fit all that is required on the deck to secure and work the rigging and sails. The following is a diagram of the deck of the ship, with each object in its proper place, and further on will be given enlarged drawings of each, with description :—




The first object, *a*, is a 1½-in. or 2-in. screw-eye, with large eye for the bowsprit to go through; this must be carefully screwed into the thick wood at the stem through the deck; *b* is the chock for the heel or inner

end of the bowsprit to fit in; *c* is the horse for the foresheet to work on; *d* is the hole or step for the mainmast; *e* is the hatchway or opening in the deck, just large enough to admit the hand easily; *f* is the horse for the mainsheet to travel on; *g g* and *h h* are 1-in. eye-bolts (screw-eyes) for the bowsprit guys, and main-backstays to be hooked to; these must be firm and strong. Here is a diagram of masts, spars, and rigging only.

*a* mainmast.
*b* topmast.
*c* gaff.
*d* mainboom.
*e* starboard or right backstay.
*f* larboard or left backstay.
*g* bowsprit.
*h* starboard bowsprit guy.
*i* larboard bowsprit guy.
*j* bobstay.
*k* India-rubber ring to keep boom down.




Inserting the screw-eye for the bowsprit, *a*, requires no explanation: it must be just large enough in the eye for

the bowsprit to go through; if not large enough, file it to the necessary size with the rat-tail file.

The chock *b* (p. 49) must be made out of a piece of oak or mahogany about 3 in. long, and about 1 in. thick; a hole ½ in. deep, and of the diameter of the end or heel of the bowsprit should be made in it; thus— ; the other end may be tapered off to taste, and screwed strongly right through into the deck exactly amidships. It should be of such a height that when the bowsprit is in its place it shall be perfectly in a line with the mid-deck line, and also with the stem and stern (as shown in the diagram, p. 50). The chock may be placed any distance from the stem, so long as it is not too close to the horse for foresheet (diagram, p. 49).

The horse for foresheet is made as follows: Cut two diamond or other shaped pieces of sheet brass, ⅛ in. thick, and about 1½ in. in length; thus— ; make a small hole at each corner, and a larger hole in the centre; then take about 5 in. of thick brass wire, and bend it at the ends so as to be 4 in. apart, put the ends through the

plates; thus—

, and solder or get soldered, the wire to the plates underneath; bore holes in the deck 4 in. apart, 2 in. or so forward of the mainmast, and at equal distance from the mid-deck line; fit in the two ends, *a a*, and screw the plates firmly to the deck: if it is desired to be very neat, all the small holes should be countersunk.

Another horse must be made exactly the same way, but 1 in. wider and somewhat stronger, for the main-sheet (diagram, p. 49, *f*), and put as near the edge of the stern as due regard for strength will permit.

The step or socket for the mainmast comes next. Get a short piece of brass tube ⅜ in. internal diameter, and about 7½ in. long; have a screw soldered into one end; thus—

Bore a hole in the deck exactly amidships, and of exactly the same diameter as the outside of the pipe

or socket 13 in. from the stem, *i. e.* ⅓ the length of the deck; put the brass tube in the hole, and screw it tightly to the bottom of the ship, perpendicular to a line drawn from stem to stern, and also from side to side, so that the mainmast when put in it will be perfectly upright from all sides; file the top of the socket off if too high, so as to leave not more than ¼ in. above the deck.

To make the hatchway or hole (*e* in diagram, p. 49), cut out an oval or oblong hole in the centre of the deck, just abaft or behind the beam (diagram H, p. 39); a water-tight cover or stopper must be made for this with cork, wood, or anything the maker pleases, it matters not provided it is not much above the level of the deck, is water-tight, and can be taken in or out.

Now bore a small hole through the deck, close to the starboard quarter (see *i* in diagram, p. 49), make a short peg to fit it, and call it the *pump;* by inclining the ship towards this hole after sailing, and drawing the peg, you can see if she has leaked, and let the water out if necessary.

The screw-eyes *g g* and *h h*, p. 49, explain themselves by referring to *e*, *f*, *h*, and *i*, in diagram, p. 50; they are to hook on the rigging as there shown. These eye-bolts, *h h*, must be as close abaft the mainmast as is consistent with their properly supporting the mainmast, both laterally and aftwards. The reason is that if placed too far aft they would interfere with the mainboom swinging far enough out when running before the wind; the nearer the mainboom is to a right angle with the keel, the steadier and faster the ship will run before the wind. *g g* may be in a line with the horse for the foresheet *c* (diagram, p. 49); care must be taken to screw them through the edge of the deck, and into the gunwale firmly.

To cast the rudder, make a small wooden mould or box similar to that for the keel, about 6 in. long, 3 in. deep, and ½ in. wide.

Insert two moderately thick pieces of brass wire through the bottom, and about an inch into the box (as in dotted line), bend them so as to make them stick in the lead, and just as far apart as are the two screw-eyes for this rudder in diagram "stern," p. 44; pour in 1¼ lbs. of melted lead, trim the lead with the rasp, and turn the wires thus— ; and when hooked into the screw-eyes or gudgeons, it should act easily either to right or left. Skilful or tasteful young model yacht sailors can vary the shape of the rudder; I have given the simplest and easiest shape to make.

This completes all the deck fittings necessary for working and sailing the ship, but if on trial the rudder should be too heavy or too light, another must be made —experience is the best guide.

I need hardly say that every direction I have given need not be followed to the letter; those who see and know what is required can do many things in their own way, and much must necessarily be left to individual taste, skill, and ingenuity.

At this stage, varnish the deck with copal varnish, and paint the hull whatever colour or colours fancy dictates; I, however, advise one colour only for the hull, it is less trouble and easier to repaint or repair, eventualities often recurring with model yachts.

## CHAPTER IV.

# HOW TO FIT MASTS, STANDING AND RUNNING GEAR, &c.

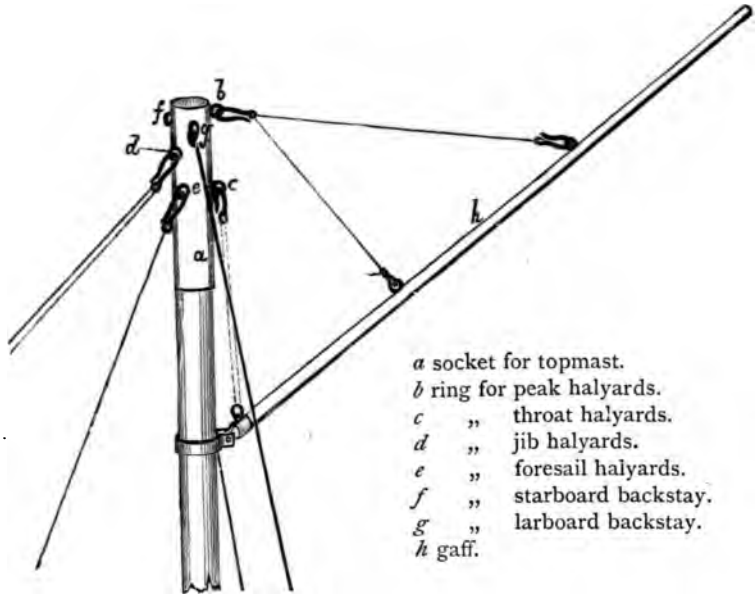
## CHAPTER IV.

### HOW TO FIT MASTS, STANDING AND RUNNING GEAR, ETC.

THE best material for making masts and spars is bamboo-canes, these require little trimming, can be procured of any thickness and length, and are stronger, lighter, and more elastic than any other kind of wood.

The mainmast must be 38 in. long from the deck, and $\frac{5}{8}$ in. diameter at the foot, to fit the socket or step (diagram, p. 52), slightly tapering to the head or top; the head must be fitted with a brass ferrule or socket for the topmast (like a fishing-rod), and must be *included* in the above 38 in. length, but as the mast has to fit in the step, the depth of the step must be added to it.

If the yacht builder cannot solder or get soldered eyes on the socket at the mast-head, he must lash them on for the foresail, jib, and main and peak halyards, and also for the main backstays; thus—




*a* socket for topmast.
*b* ring for peak halyards.
*c* „ throat halyards.
*d* „ jib halyards.
*e* „ foresail halyards.
*f* „ starboard backstay.
*g* „ larboard backstay.
*h* gaff.

Rings *d* and *e* must be lashed forward, *b* and *c* aft, *f* and *g* one on each side, *e* and *c* about an inch below *f* and *b*; this is all necessary for the mainmast.

The bowsprit must be 34½ in. long outside the stem and a trifle thicker than the mainmast; be careful to allow the extra length from the stem to the chock (p. 51); it must have rings (these rings can be got at any fishing shop, of all sizes— ∘ O O O, any size will do, so that the lines used pass easily through)

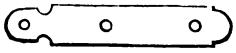
for the guys and bobstay lashed on, and hooks for the jib and foresail; tip the end with a band thus, to prevent damage to it by collisions—

*a a* rings on each side, close to the end, for the guys.
*b* ring for bobstay underneath.
*c* hook for jib tack.
*d* hook for foresail tack. } both to be on top.

The hooks, *c* and *d*, for the tacks cannot be lashed on till the sails are made and fitted, for as the jib must always swing clear of the foresail, and the foresail clear of the mainmast, it is best to try them before lashing on these hooks.

These hooks are made of stout brass wire about 1½ in. long, flattened where to be lashed, and the end turned up with the pliers; thus— ; the hook ¼ in. high is plenty, so that the sails may be as low down as possible.

Next, with the pliers make a dozen hooks or so, this

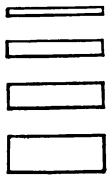
shape and size— , of strong wire; and two of still stouter wire, this shape and size, say 1 in.— ; the former are for the various standing and running gear, and the two latter for the foresail sheet and mainsheet. Make also a dozen or so of wood or bone slides to pattern—  ; one hook and one slide at least is required for every rope that has to be lengthened or shortened. Ladies' bone meshes of suitable width and thickness make the best slides.

The following diagram shows the application and use of these in all instances; say you are fitting the larboard mainbackstay (*f* in diagram, p. 50), make fast your line to the ring (*g*, diagram, p. 60) at the mainmast head, pass the line through two holes of the slide, then through a hook which must be hooked on to the screw-eye (*f*, diagram, p. 50), back through the other hole in the slide, and make it fast there by a knot, only see the line is not too long or too short for convenient working. By this means, as you will soon see, any rope can be fitted that requires it, and can be lengthened or short-

ened in a moment without danger of slipping; thus—

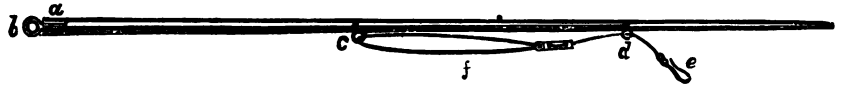
The best line for all the gear is suitable sizes of fishing-line. If the line kinks, *i. e.* gets into twists, put a yard or so at a time through the loop of the key in a door, cross it over itself once or twice, and rub it backwards and forwards, that takes all the turn out.

The brass wire required may be these sizes—



for small hooks.
„ larger hooks, &c., &c.
„ foresheet horse.
„ mainsheet horse.

Now comes the mainboom (*d*, diagram, p. 50); it must be 36 in. long, a little thinner than the mainmast, and must be fitted thus—




Put a brass band, *a*, ½ in. wide, round the thicker end, drive a peg strongly into the hollow of the bamboo (the band is to stop it splitting), and screw in a screw-eye,

as shown at *b* above; then lash one ring on at *c*, say 15 in. from *a*, and another at *d*, both on the under side of the boom, this last crossways. These two rings are for the mainsheet *f*, and are most important; they must be well put on, the latter, *d*, about 12 in. from the outer end of the boom, so as to work well when the hook *e* is hooked on to the horse for this sheet (viz. mainsheet) at the stern; this hook, *e*, is to be one of the large hooks (as shown p. 62).

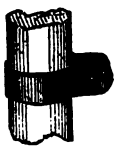
In order that the mainsheet should not have to be made too long, and thereby get foul of the stern, &c., when the boom swings over in running or reaching, it is best to have another sheet called the "running sheet," to be fitted as follows :—

Screw a screw-eye (a strong one) into the middle of the deck, just abaft the hatchway, lash a ring to the underside of the mainboom exactly over the screw-eye when the mainboom is amidships, fasten a strong piece of line to the screw-eye, put on a slide, then pass it through a hook, and fasten off to the slide, and

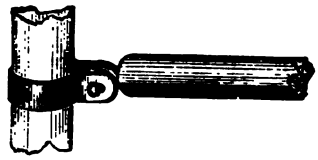
hook into the ring on the mainboom; and let this sheet be just so long, that when the mainboom is out as far as it can go for the backstays, it will just take the strain off the backstays, on whichever side it happens to be, in running before the wind.

By means of this running sheet, when the after mainsheet is unhooked, the mainboom can be kept in or let out to any required angle without the sheet fouling, and as the running sheet is fast to the ship only, it can be easily unhooked from the mainboom when unrigging. Still, this running sheet is not absolutely necessary, but is a very great convenience.

To attach the mainboom to the mast, and allow it to move freely, get a strip of sheet brass ⅜ in. wide, just long enough to go *round the mast* (close to the deck), and ⅜ in. over at each end; bore a hole at each end thus— , and bend it round the mast. With the pincers nip the two ends close together, and so that the two holes are in a line thus—



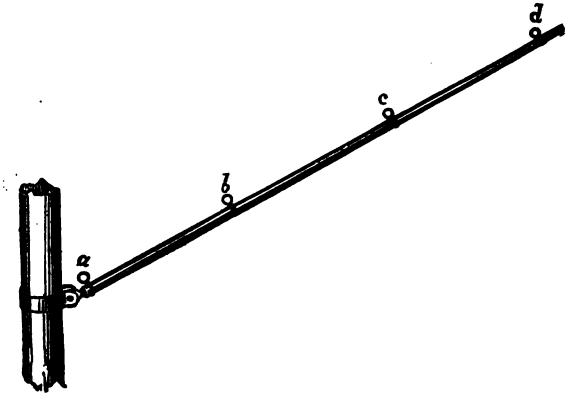
Now put the screw-eye at the end of the mainboom between these two holes, fasten it there with a bit of wire turned round at each end; thus—



No arrangement can be more perfect or stronger than this.

The above operation has to be repeated for the *jaws* or inner end of the gaff (*c* in diagram, p. 50), but the ring must fit the head of the mast instead of the foot.

The gaff must be 21½ in. long, and a little thinner than the mainboom; thus—

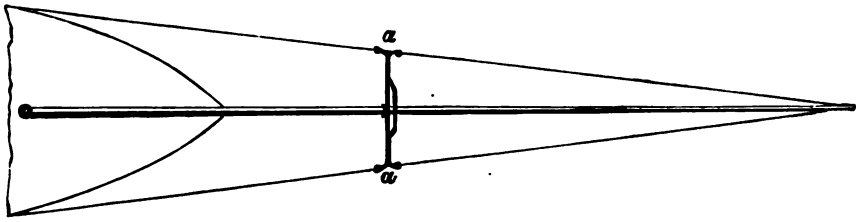


Lash one large ring at *a*, as close to the end as possible, two others, smaller, further out at *b* and *c*, and one at *d*; all these rings must be on the top side of the gaff, *d* an inch from the outer end of the gaff, for the sheet of the topsail to be hooked on (see frontispiece).

The topmast is a taper bamboo, the lower end of which must fit tightly into the socket at the mainmast head, it must be 24 in. long outside the socket; lash two small rings at opposite sides, ½ in. from the head, put a knob on the top (called the truck), and the topmast is ready.

The boom for the foresail (*i. e.* the spar that extends the foot of the sail) must be 20 in. long, that for the jib 25½ in. long, and both about the thickness of the gaff; here, however, use your judgment. Lash rings on for the sheets of each; each must have a sliding sheet (see drawing at end of this chapter) the same as for the mainsheet (p. 63); the jib sheet, however, requires no hook at the end, but must be made fast to the bowsprit, or, if greater precision is required, a horse may be made

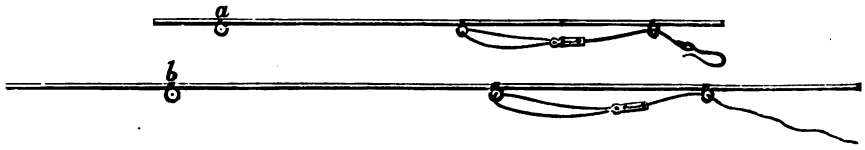
for the jib as for the other sails, and fastened in its




proper place across the bowsprit, and to the guys as above; it may be made of thin brass wire, as follows, merely taking care that it is the right length, and that the horse is an inch or so less than the foresheet horse. It is made of four pieces of wire, the horse bent, as in diagram below, and the other pieces soldered to it; the

guys may be passed through the loops *a* on their respective sides, and knots made to keep them in place; it will be perfectly self-acting, and never get out of place; the weather guy being always tight will always keep it nearly horizontal; it makes the jib, like the other sails,

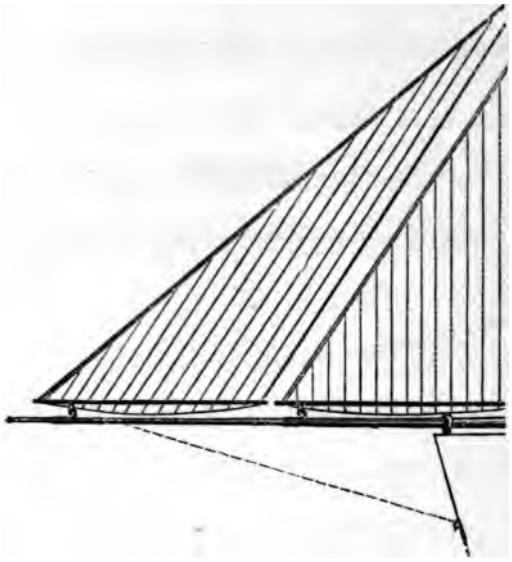
a good *driving* as well as steering sail. Besides the above rings, another must be lashed on the outer end (all the rings on the boom are underneath) of each boom, *a* and *b*, about 2½ in. from the end; thus—




and must both be crosswise, as they are to secure these booms to their respective hooks (see *c* and *d* on bowsprit, p. 61; and also diagram, p. 70). This manner of fixing these sails is the best to keep them tight and flat when in use.

This diagram shows the best mode of fixing the tacks of jib and foresail to the bowsprit; by this means, when the sail fills with the wind, it raises the after end of the boom, *depresses the fore end*, and thus tightens the luff of the sail and keeps it taut, which is very necessary. This diagram also shows how the jib and foresail swing

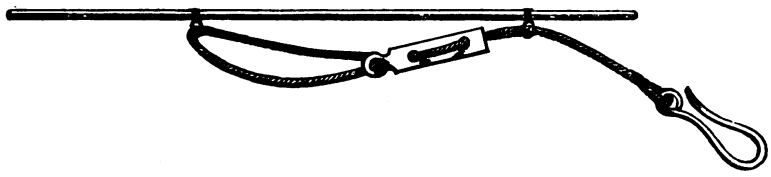
clear of each other; also that the jib must not quite go to the end of the bowsprit, or it may be knocked off.



When all the rings are carefully and neatly lashed on, say with strong white thread,—lashing is the best, because it does not weaken the spars by making it necessary to bore holes in them,—varnish all the lashings with copal varnish, it will preserve them and prevent them slipping.

Each maker must use a little judgment, and *under-*

***stand what he is going to do before he does it***, and as in some instances the spars, or what not, may be a little too long, the best plan is for the maker to try each and everything before spoiling his work.



*Enlarged Diagram of how to fix the sliding sheets for the respective booms, i. e. jib, fore, and main.*

## CHAPTER V.

# HOW TO MAKE THE SAILS AND SET THEM.

## CHAPTER V.

### HOW TO MAKE THE SAILS AND SET THEM.

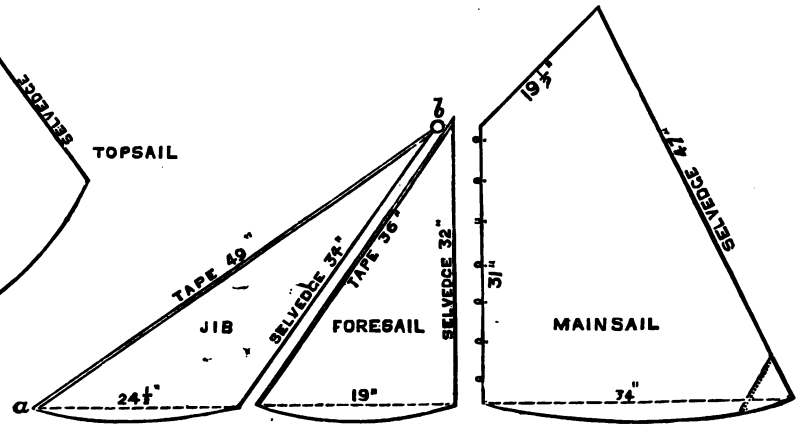
THE speed and precision in the sailing of a model yacht, depend much more upon the sails than the hull, and the greatest care must be taken in making them.

If pains are taken to carry out the following directions, an excellent suit of self-acting sails will be the result.

The best material is either bleached or unbleached calico, 1 yd. wide, at 8*d.* per yd., and for a 2-ft. yacht 10*d.* per yd.; 3 yds. are sufficient for a 3-ft. boat. Steep the calico in clean water, and dry it across a line before using it. It is always better to cut the patterns of the sails out in paper, and try them in their places, before cutting the stuff.

On the next page are given diagrams of the four sails for a cutter, and as all are cut on the cross, care

must be taken when hemming them not to pucker or stretch the material; the after leach, *i.e.* the behind edge of all the sails, must be the selvedge, and must not be hemmed. In cutting out, allowance must be made for the hems, the measurements given being the actual sizes required.

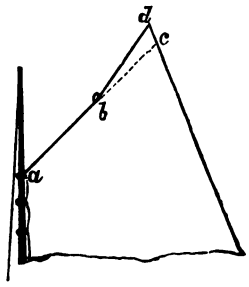



The bottoms of the sails must be slightly rounded, as shown above, and a narrow tape must be sewn across, as shown by the dotted lines, to keep the sails from stretching.

All the sewing for these sails can be done perfectly and expeditiously with any lock-stitch machine; it will sew them exactly even without puckering, and all

that has to be done by hand is to fasten off the corners. I make all my own sails, and can, without hurry, make a full large suit for a 3-ft. boat in an evening.

The selvedges are not to be hemmed, because the after leaches of all the sails should allow the wind to pass freely off. The sizes of the sails are marked on the diagrams distinctly; allow ½ in. extra on the outer leach of the mainsail, from *c* to *d* in diagram below, so that it may be slightly loose; this helps to steer materially, as the leach will shake before the body of the sail, if the vessel comes too much up in the wind, and so losing its power allow the ship to fall off and sail steadily. This diagram shows how to cut the head of the mainsail; the dotted line shows how the sail would be if cut straight, therefore cut straight from *a* to *b*, then slant off to *d* at rather more than midway from *a* to *c*. Make eight or ten eyelet holes at equal distances in the hoist of the mainsail, and fix a ring or grummet



of twine in each hole to fit loosely round the mainmast; these are better than brass rings or wooden hoops, and weigh nothing.

The lower outer corner of the mainsail should be double for 2 or 3 in. (see diagram, p. 76), to strengthen it; in fact, the corners of all the sails are none the worse for being so doubled.

Now fix the sail to the mainboom and gaff; with a needle and strong thread is best: do not pull the sail too tight. The boom will then be 2 in. or so too long; do not cut that off, it is useful to turn the ship with; leave also the extra length of the gaff, it looks better. The head of the sail must be laced or tied to the gaff at intervals of 1 in., but on no account lace the foot of the sails to the booms; (for reason why see p. 29) the sail is then ready.

In setting, *i. e.* putting on, the mainsail, when you have passed the foot of the mainmast through the jaws of the gaff and all the grummets, then before passing it through the jaws of the mainboom, put on

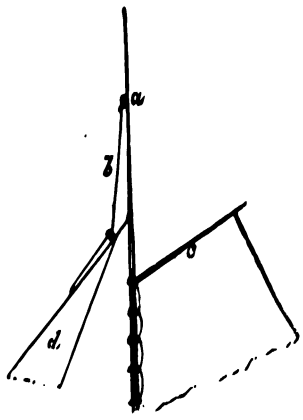
an India-rubber ring, and then the mainboom; the ring must be pretty tight to the mast, and is very useful to keep the mainboom from slipping up. For position of this ring, see *k* in diagram, p. 50.

To hold the mainsail up, the inner ring on the gaff and lower after-ring on the mainmast head, must have stout twine passed through and made fast. This is called the throat-halyards.

The gaff must be kept at its proper angle by means of twine made fast to the next ring on the gaff, passed through a hook, which hook into the upper after-ring at the mainmast head, and fasten off at the third ring on the gaff. This is called the peak-halyards. With these two, peak and throat-halyards, you can easily fix the mainsail, so that when the mainboom *is half an inch above the deck at the mast*, and about an inch or so clear of the mainsheet horse at the stern, the sail shall set perfectly flat.

The annexed arrangement of the topmast stay is excellent; it keeps tight the luff of the jib, slightly

slacks up the after-leach, and is no trouble whatever to fix or unfix. It simply consists of putting a large




ring (so that the hook can pass through) at the top point of the jib, pass the topmast stay-hook through, and hook it into a ring sewn on to the luff any distance down you think sufficient, as in diagram at side. *a* topmast, *b* topmast stay, *c* mainsail, *d* jib.

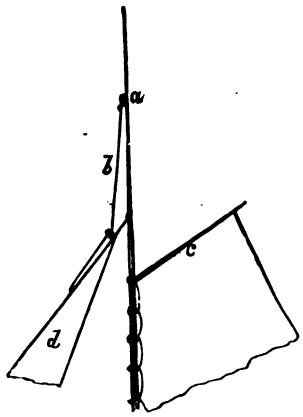
The jib must have a piece of tape stitched from *a* to *b* on the double, ½ in. each side (see p. 76), and a ring sewn on at *b*. A hem only in the luff would be useless on account of the strain. The same must be done to the foresail; hem the bottoms, and leave the selvedges as they are.

Lash them to their respective yards or booms (see diagram, pp. 69 and 70). Of course the sail must be on the top of the boom, and the rings and sheets underneath; try them in their places; now lash

on the hooks to the bowsprit (see p. 61), and you will see exactly where to put them; mind, the jib must swing just clear of both bowsprit and foresail (see frontispiece), and the foresail just clear of the mast and stem. Fit both these sails at the head with a hook and slide, the end of the line to be fast to the head of the sail, and the hook is to hook into the rings (respectively) at the mainmast head (see frontispiece), which shows exactly how all the sails set. The booms for these sails (jib and foresail) must be cut close, as there is no room to spare.

The topsail is 28 in. high, and reaches from the large ring in the jaws of the gaff (*a*, p. 66) to the topmast head, and before cutting it out the mainsail must be tried and set. The shape of this sail depends on the peak or angle of the gaff; and having made a pattern in paper to fit thus, make eyelet holes equidistant from *b* to head of the mainmast, and put in rings of twine to fit the topmast loosely, as was done before with mainsail; fasten a hook to each of the corners, *a*,

slacks up the after-leach, and is no trouble whatever to fix or unfix. It simply consists of putting a large ring (so that the hook can pass through) at the top point of the jib, pass the topmast stay-hook through, and hook it into a ring sewn on to the luff any distance down you think sufficient, as in diagram at side. *a* topmast, *b* topmast stay, *c* mainsail, *d* jib.



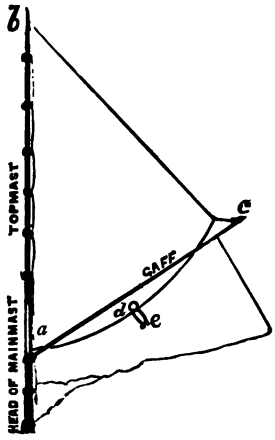

The jib must have a piece of tape stitched from *a* to *b* on the double, ½ in. each side (see p. 76), and a ring sewn on at *b*. A hem only in the luff would be useless on account of the strain. The same must be done to the foresail; hem the bottoms, and leave the selvedges as they are.

Lash them to their respective yards or booms (see diagram, pp. 69 and 70). Of course the sail must be on the top of the boom, and the rings and sheets underneath; try them in their places; now lash

on the hooks to the bowsprit (see p. 61), and you will see exactly where to put them; mind, the jib must swing just clear of both bowsprit and foresail (see frontispiece), and the foresail just clear of the mast and stem. Fit both these sails at the head with a hook and slide, the end of the line to be fast to the head of the sail, and the hook is to hook into the rings (respectively) at the mainmast head (see frontispiece), which shows exactly how all the sails set. The booms for these sails (jib and foresail) must be cut close, as there is no room to spare.

The topsail is 28 in. high, and reaches from the large ring in the jaws of the gaff (*a*, p. 66) to the topmast head, and before cutting it out the mainsail must be tried and set. The shape of this sail depends on the peak or angle of the gaff; and having made a pattern in paper to fit thus, make eyelet holes equidistant from *b* to head of the mainmast, and put in rings of twine to fit the topmast loosely, as was done before with mainsail; fasten a hook to each of the corners, *a*,

*b*, *c*, to hook into the respective rings already placed for them ;—if the hooks are too short, use a piece of twine sewn to the sail, at *b* and *c* only, to lengthen them ;—now sew a button at the edge of the curved bottom of the sail at *d*, and a loop to button on it on the head of the mainsail at *e;* this keeps the rounded foot always flat.




The masts, sails, and gear being now all complete, try them on, and make any little alterations that may be necessary. If my directions have been intelligently followed, the sails will be exactly the sizes and shape of those in the lateral diagram, frontispiece.

A strong, fine piece of line, fitted with a slide and hook, in the usual way, the end made fast to the topmast head ring forward, and the hook to be hooked into the ring at the jib head or top corner (see the diagram p. 80, and also frontispiece). This is to raise the foot of the jib, if required, and also to steady the topmast;

this is a simple though not so effectual a topmast stay as that given, p. 80.

The sails must be as tight and flat as possible when set, and the mast must be kept exactly upright by the backstays aft, and by the jib and foresail forward, the tape on the jib and foresail taking the place of stays or ropes used for that purpose in ordinary yachts, which are by this means dispensed with in models.

Sail and mast-making is not yet done. Another suit of masts, spars, and sails, of exactly two-thirds the length, breadth, and height of these, must be made. It is called the *storm suit*, and is used when the wind is too strong for the first suit. Reefing is not practicable in a cutter.

Some model yachtsmen have three or four suits of sails, &c.; I find two sufficient, because I don't sail a yacht when there is scarcely a breath, and I don't sail one when it blows a hurricane, and so I find two suits enough. Still if you race in matches, and mean winning, you must have both a larger and smaller suit,

for you can never tell what the wind will be on the race day, and must be prepared.

Now that all your sails are complete, paint the hull, and varnish the deck again; tip the end of the masts and booms the colour of your yacht, it looks ship-shape.

A pole of pine or deal, 6 ft: long, with a double hook at one end, is required to handle and turn the ship. Herewith drawing of the hook. One side is to push the ship out, and the other to pull it in or turn it.

Lastly, two bags are needed, each to contain 1 lb. of shot, for shifting ballast to trim the ship, if you require her deeper aft or forward.

## CHAPTER VI.

# HOW TO SAIL AND STEER A MODEL YACHT.

# CHAPTER VI.

## HOW TO SAIL AND STEER A MODEL YACHT.

THE action of the wind upon the sails of a vessel presses her down sideways and forwards, this causes the lee bow (viz. that on the side opposed to the wind) to be more immersed than the weather bow (or wind side bow), and the curve of the bow acting like a rudder or wedge, forces the vessel strongly up in the wind, in exact proportion to the strength of the wind. This is a simple mechanical law any one can understand after watching a model yacht for five minutes, and to counteract while utilizing it, I build a model yacht much deeper aft than forward, make the bowsprit very long, the jib and foresail large, and the mainsail narrow at the head and slack in the outer leach or edge. These arrangements, properly adjusted, nearly neutralize this tendency of the lee bow to force the ship to

windward, and leave only just enough, so that by setting the sails in the way shown later, a model yacht steers itself perfectly. Great care must be taken not to overdo it, otherwise the vessel will run off the wind, and not steer herself at all.

The part which the increased depth of keel aft plays in steering a model yacht is this; as the sails are very evenly balanced, and exert little more force at the stern than at the bow when *the vessel is upright in the water;* yet even then there is always the tendency more or less to come up in the wind, and as the bow is not so deep as the stern, the lateral pressure of all the sails forces the vessel sideways (called leeway),—she makes more *leeway forward than aft*, and thus this particular arrangement helps to make her steer herself. Necessarily, when the wind blows strongly it is of very great use, and enables increased length of bowsprit to be dispensed with: too long a bowsprit is a great drawback, it dips in the water, and is difficult to fasten firmly.

Again, a model vessel being well up by the stem, and deep aft, possesses another power of self-steering, viz. when the wind presses her down forward (when on the wind), it lightens her aft; this, of course, permits her to gripe more to windward, as she holds more water forward and less aft, but if she comes up too much, so as to relieve the mainsail of a great part of its pressure, the opposite action results, the bow is lightened and the stern depressed exactly in proportion, so that under all circumstances the vessel possesses a self-acting power to steer herself.

Now, as just shown, a model yacht, partly by the action of the sails (particularly the mainsail), and partly by the action of the lee bow, will always keep close to the wind,—in fact, too close; therefore, to make her steer herself, the jib and foresail are kept in a little closer (*i. e.* more in a parallel line with the keel) than the mainsail. So if the vessel comes too close to the wind, first the outer leach of the mainsail loses its power and shakes, and if this does not suffice, *as it*

*should*, to make her fall off again, the whole mainsail will shake, and as the jib and foresail must keep full, the ship pays off till the mainsail fills again. So an equilibrium is attained, and in a steady wind, on the sea for instance, the yacht would sail on in the same direction as if on rails, till the sails dropped in pieces.

This diagram gives the disposition of the booms by means of their respective sheets. To make a yacht sail full and by, *i. e.* close to the wind, and neither run off or shake, the jib is nearly parallel to the bowsprit, the foresail less so, and the mainsail least

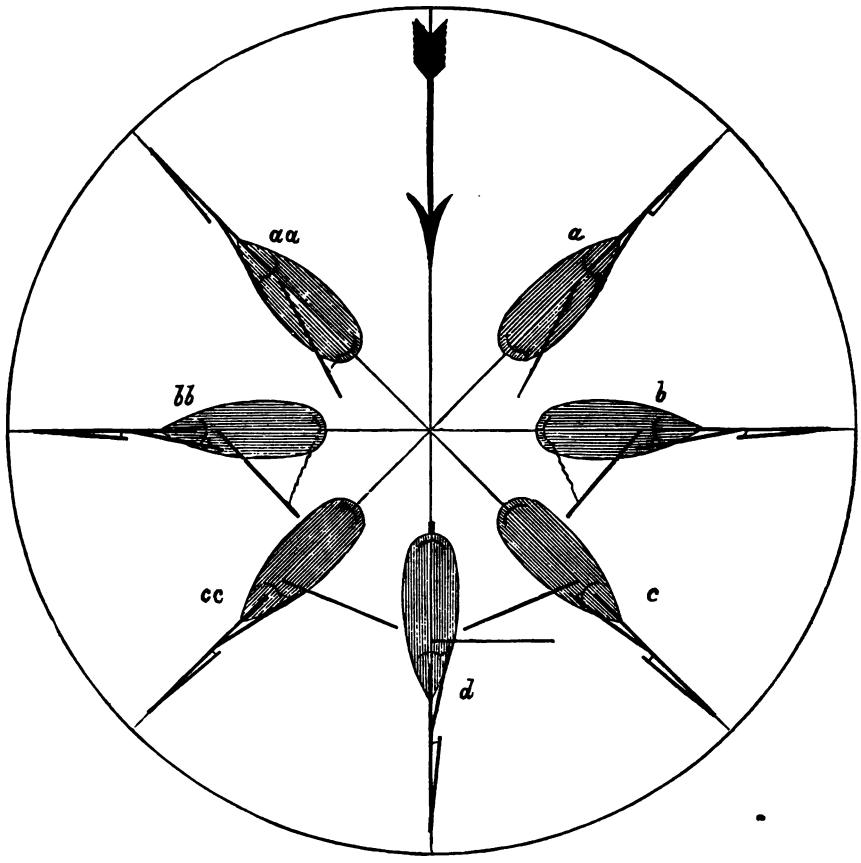
of all, and clearly shows the principle, for it is evident that if the vessel turned more towards the wind, the mainsail would shake, and the jib and foresail keeping still full, would turn the ship back to her course again, viz. "full and by." On the other hand, she cannot

run off the wind, because the mainsail, well full as it must be, if she ran off, would bring her up again instantly.

I presume every intelligent person understands that a vessel cannot sail with her head to the wind (all the sails must shake, and she would go a-stern), and few vessels can sail nearer, if so near, as at an angle of 45° to the wind. In the next diagram (p. 92), will be shown the way to sail the vessel in any *possible* direction, and how the booms must be disposed, and the rudder or rudders and ballast bags used to accomplish it.

The wind is supposed to be blowing in the direction the arrow flies, and by holding this diagram with the arrow towards the point the wind is blowing from, your vessel can be made to sail in every direction there indicated.

No vessel can head nearer towards the wind shown by the arrow, than *a* and *aa*, one being on the larboard, the other on the starboard tack (as it is called), *i. e.* about 45°, four points of a compass, or half a right angle.




The vessel at *a* is therefore sailing close to the wind on the larboard tack, with the sails disposed for that purpose, as already shown (p. 90); to put her on the other tack, simply turn her in the direction *aa*, head to wind; the sails, being self-acting, will go over

of themselves by the force of the wind, and she will continue on that tack till stopped or turned.

To sail her as at *b*, ease off the mainsheet till the mainboom is at an angle of 45° (this is called wind abeam) to the keel of the ship, and she will do so; it is seldom necessary to touch the jib or foresheets, leave those sails as at *a*. To sail her as at *bb*, turn her round, head to wind, and the sails take the same place on the other side, and that is done.

To sail as at *c*, let go the mainsheet altogether; if the wind is not too strong, she will do so, but if it is too strong, a light rudder, self-acting, of about ¼ lb. weight must be made and used, and that will do it. Turn her round as before, head to wind, if you wish to sail her as at *cc*. The rule is simple enough: if the sails are set, and propel her in a given direction on the one tack, she will, if turned, sail in the corresponding direction on the other tack.

To run before the wind at *d*, with the mainsheet let go, hook on the heavy rudder, and she will run more

or less true before the wind, according to the perfection with which the ship is built and the rudder balanced. The cause is this: if the vessel turns, say to starboard, the wind necessarily presses her over to larboard, the self-acting rudder (being exactly upright when the ship is upright) falls over to larboard also, and instantly puts her straight again; the exact opposite takes place should she turn to larboard, and so *she must sail straight before the wind.*

When the wind is very light, it will sometimes occur, that the vessel on account of the large jib and foresail, will run off the wind; if so, put one or two of the bags of shot inside in her bows, and most likely that will remedy it; if not, change the angles of the jib and foresails, *i. e.* let the jib sheet out more, and haul the foresheet in as much as the jib was, so that you would then be steering more by the foresail than by the jib. This is sure to succeed.

Before all these manœuvres can be successfully performed, some little practice is necessary, of course;

ships, like everything else, have little ways of their own, and must be studied.

The topsail must always be kept set, and needs no touching after being once set, for though of no great use as a propelling sail, save off the wind, it is so as a steadying sail, being so lofty. My experience has taught me never to dispense with it.

To prove the certainty with which a model yacht must sail in the direction intended, you can, as an experiment, put the vessel's head in the water in any direction you please, and she will immediately take the *course for which the sails are set*, no matter how you put her in the water. For instance, place her in the water, *head to wind*, with the mainsheet let go, and the heavy rudder on, *i. e.* to sail as at *d* (p. 92), and she will of her own account turn round and run before the wind, an operation which, to those not in the secret, seems like magic.

Rigged in the way I have described, with every part of the standing and running rigging being made fast

by hooks and slides, a cutter can be completely unrigged in one minute, and rigged again in three minutes: I have done it in these times easily. This is a very great advantage; there are no knots to make, no time is lost, and yet the rigging is as strong and as perfect as possible, and never fails till worn out.

I hope I have now made all clear, and that my readers may be enabled to build ships, and rig them to sail with as much satisfaction to themselves as mine are to me.

Model yachts can be rigged to sail and steer well, as schooners, luggers, &c., and I have vessels rigged in those ways. Should this treatise meet with success, I purpose writing a second, dealing with this subject.

## MATERIALS FOR MODEL SHIPS.

BLOCK of wood: white pine or soft deal; at almost any wood-yard, and particularly at those in the neighbourhood of the docks; cost for a 2-ft. boat, 2*s.* 6*d.*, for a 3-ft., about 10*s.*

Masts, booms, &c., of bamboo canes, at florists, who sell cheap bamboos for about 8*d.* per dozen for gardening purposes; the best can be selected, and they will serve for masts, all the spars of a 2-ft. boat, and for booms, gaffs, and topmasts of 3-ft. boats. Bamboos for the mast, bowsprit, and mainboom of 3-ft. boats can be got at fishing-tackle shops and toy shops; both sell cheap bamboo fishing-rods at about 3*d.* each. They can be easily selected of the required thickness and length. Excellent bamboo canes for booms, gaffs, and topmasts can also be obtained at umbrella shops

and stick shops, but they cost more—1*d.*, 2*d.*, or 3*d.*, and even 6*d.* each.

Twine, white line, &c., for standing and running rigging, can be had at fishing-tackle or cord and twine shops.

Calico and tape at any linendrapers.

Lead at any plumber's shop, 2*d.* or 3*d.* per lb.

Paint and copal at any oilman's. Paint 6*d.* or 8*d.* per lb. Copal varnish about 1*s.* per pint; 3*d.* worth is enough for a 3-ft. boat

Brass and copper wire at most ironmongers, as also screw-eyes of any size. If the two former cannot be readily obtained, Messrs. Jackson and Sons, 17, Sun Street, Finsbury, keep every size in brass and copper wire, and every thickness in brass and copper sheets; all these are sold by weight.

All sizes of rings can be had at fishing-tackle shops. 1*d* or 2*d.* per dozen.

Ferrules or bands for tipping the ends of spars to prevent them splitting, can be got at fishing-tackle

shops, and the amateur builder can file off any length required; they are very cheap. For small bands, pipe mounts are excellent, very light and thin, and easily cut to any length. Most tobacconists keep them in all sizes, 1*d* or 2*d*. each.

If the boat builder cannot get or make bands, lash or bind the ends of the spars neatly and strongly with good white thread, and then paint it well with copal. It will answer every purpose, but does not look so neat and trim.

Lastly, slides can be made of any hard wood as well as of bone, and the requisite holes bored with a brad-awl, and then seared with a red-hot skewer.

# GLOSSARY.

ABAFT, } towards the stern.
AFT, }

AMIDSHIPS, middle of a ship or anything.

BACKSTAY, ropes which support the mast sideways and backwards.

BEAM, breadth of a vessel, also the support of the deck.

BOARD, the distance sailed on one tack.

BOBSTAY, the rope that keeps the bowsprit down; reaches from end of bowsprit to cutwater.

BOOM, any spar used to extend the foot of a sail.

BOW, front part of a vessel.

BOWSPRIT, spar projecting in front of a vessel to set the jibs on.

BULWARKS, the wooden railings round the deck of a ship.

CHOCK, piece of wood to hold anything firmly.

CLOSE, a vessel being as near the direction of the wind as she can go without shaking.

COUNTER, the projection of the stern.

CUTWATER, the sharp part of the bow.

DECK, the covering of the ship to keep the water out, &c.

DRAW, a ship draws so much water, *i.e.* it is so many feet in the water.

ENTRANCE, the forward part of the bottom of a vessel, tapered off to the cutwater, so as to cleave the water.

FALL OFF, when a vessel turns from the direction of the wind.

FOOT, bottom of a mast or sail.

FORE AND AFT, any sail which does not cross the mast.

FORESAIL, sail in forepart of a ship.

FORWARD, fore part of a ship.

FULL, when the sails are distended by the wind.

FULL AND BY, close to the wind yet not shaking. *See* CLOSE.

GAFF, the spar which supports the head of a fore and aft sail.

GRUMMET, a ring made of rope.

GUDGEON, a sort of eye-bolt for the rudder to work on.

GUNWALE, top of the side of a ship on which the deck is fastened.

GUY, rope to keep and secure the bowsprit, &c., laterally.

HALYARDS, ropes used to hoist the sails.

HATCHWAY, openings in the deck of a ship.

HEAD, top of a mast or sail.

HOIST, height a sail is pulled up.

HOLD, the inside of a ship.

HORSE, long bars of iron on which the sheets of sails work.

HULL, body of a ship.

JAWS, any arrangement to secure a gaff or boom to a mast, and allow it to swing from side to side, &c.

JIB, a three-cornered sail in front of a ship.

KEEL, the centre of the bottom of a ship.

LACED, tied in a certain way.

LARBOARD, left.

LEACH, edge of a sail, generally the side.

LEE, side of a vessel farthest from that from which the wind blows.

LEE-WAY, the side-way motion of a ship caused by the side pressure of the wind.

LUFF, to go closer to the wind.

LUFF (of a sail), edge of a sail nearest the wind.

MAIN-HALYARDS, ropes to hoist the mainsail.

MAINMAST, the lower mast in a cutter.

MAINSHEET, the rope or gear to secure and regulate the after lower corner of the mainsail.

NEAR, same as close. *See* CLOSE.

OFF. *See* FALL OFF.

OVERALL, from stem to stern.

PAY OFF. *See* FALL OFF.

PEAK, the angular head of the mainsail.

PEAK-HALYARDS, ropes to hoist the outer end of the gaff.

QUARTERS, both sides of a ship close to the stern.

REACHING, sailing with the wind abeam or nearly so.

REEFING, reducing the sails by tying them up smaller.

RUN, the after part of the bottom of a vessel, tapered off to the stern-post, so as to leave the water freely.

RUNNING, sailing with the wind astern or nearly so.

RUNNING GEAR, any ropes used for hoisting the sails or yards.

SELVEDGE, the even edge of linen, canvas, &c.

SHAKE, when the sails shake in the wind and so lose their power.

SHEER, slope of a vessel downwards to midships from stem and stern.

SHEET, robes used to secure and regulate lower after corner of sails.

STANDING GEAR, any fixed ropes, as backstays, &c.

STARBOARD, right side.

STAY, ropes used to support the masts forward only.

STEM. *See* CUTWATER.

STEP, socket for heel of mast, &c.

STERN, the after part of a vessel.

STERN-POST, end of keel and run, upon which the rudder is fixed.

TACK, forward lower corner of a sail.

TACK, to make a zigzag course so as to get to windward.

TAUT, tight.

TOPMAST, the second mast from the deck.

WATERLINE, line of the water on the side, &c., of a ship, showing how deep she is in the water.

WEATHER, side of a vessel, &c., nearest the wind.

WINDWARD, in direction of the wind, the side from which the wind blows.

## CONTESTS ON THE OPEN SEA BETWEEN CUTTERS "GOLDEN CREST" AND "STORM ALONG."

*1st Trial.* Strong breeze, rough sea, storm sails, foot of sails laced to booms; 1½ miles on each tack. "Storm Along" beat on each tack, about 50 yds. to windward.

*2nd Trial.* Large suits, light breeze and sea; 1½ miles on each tack. "Storm Along," all sails laced to booms; "Golden Crest," mainsail free and jib laced. "Storm Along" led a few yards once; "Golden Crest" beat, 20 yds. in 2 boards.

*3rd Trial.* Sails as in 2nd Trial, moderate breeze and sea; 2 boards, 1½ miles each. "Golden Crest" beat, 20 yds. on each.

*4th Trial.* Sails as above, moderate breeze and sea, *interchanged sails.* "Storm Along" beat, ¼ mile on each tack of 1 mile length each.

*5th Trial.* Moderate breeze and sea, "Storm Along" own sails all free from booms, and "Golden Crest" all laced; 2 boards of 1 mile each. "Storm Along" beat, ¼ mile to windward. 1 last board of 1 mile; "Golden Crest," all sails free from booms, *i. e.* both vessels own sails and alike. "Storm Along" beat, ¼ mile dead to windward.

*6th Trial.* Gentle breeze and sea, full suits and each their own. "Storm Along" beat, 40 yds. to windward in ½ mile board. "Golden Crest" headreached a little, this wind and sea showing her best points.

## TIME TABLE OF TWO MODEL YACHT REGATTAS.

4-ft. cutters. Wind strong, E. by S. 4 vessels in each heat. Course once up and down pond, 259 yds. long, 30 yds. wide; length of pond being E. and W.

| | Start. | | Run. | | Beat back. | | Time. |
|---|---|---|---|---|---|---|---|
| | H. | M. | H. | M. | H. | M. | M. |
| 1st Heat . . . . | 4 | 14 | 4 | 16¾ | 4 | 23½ | 9½ |
| 2nd „ . . . . | 4 | 33 | 4 | 36 | 4 | 42¾ | 9¾ |
| 3rd „ . . . . | 4 | 50 | 4 | 53 | 4 | 59 | 9 |
| Loser's Heat . . . | 5 | 4 | 5 | 7 | 5 | 14¼ | 10¼ |
| Final „ . . . . | 5 | 20 | 5 | 23¼ | 5 | 31 | 11 |

In this race, final heat, the three first winners fouled, and the winner of loser's heat won.

3-ft. cutters. Wind strong, W. by S. Course as above.

| | Start. | | | Run. | | | Beat back. | | | Time. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | M. | S. | H. | M. | S. | H. | M. | S. | M. | S. |
| 1st Heat . . . . | 5 | 14 | 50 | 5 | 18 | 30 | 5 | 26 | 23 | 11 | 33 |
| 2nd „ . . . . | 5 | 35 | 30 | 5 | 39 | 8 | 5 | 46 | 40 | 11 | 10 |
| 3rd „ . . . . | 6 | 3 | 5 | 6 | 6 | 40 | 6 | 16 | 5 | 13 | 0 |
| Loser's Heat . . . | 6 | 23 | 5 | 6 | 26 | 30 | 6 | 36 | 10 | 13 | 5 |
| Final „ . . . . | 6 | 43 | 52 | 6 | 47 | 25 | 6 | 54 | 50 | 10 | 58 |

This last race won by 6 in. only.

By examining above table, it appears to novices almost incredible that such precision can be attained in model yacht sailing. All the heats were won by a few feet only, and some by inches.

## BEST WATERS FOR SAILING MODEL YACHTS.

THE best ponds for sailing model yachts in London are: (1) Victoria Park Pond, but only when the wind is E. or W. (2) Round Pond, Kensington, in any winds, all sides of this pond being clear of trees. (3) Serpentine, in any wind.

Hampstead and Highgate ponds are also available, but have muddy edges, and seldom a true wind on account of the high banks.

There are also good ponds on Clapham Common and Peckham Rye.

GILBERT AND RIVINGTON, PRINTERS, ST. JOHN'S SQUARE, LONDON.

# A CATALOGUE

OF

# NEW AND STANDARD WORKS,

## *DEVOTIONAL AND RELIGIOUS BOOKS,*

AND

## *EDUCATIONAL LITERATURE,*

PUBLISHED BY

## GRIFFITH & FARRAN,

WEST CORNER OF ST. PAUL'S CHURCHYARD, LONDON.

---

## NEW AND STANDARD WORKS.

### HISTORICAL SKETCHES OF THE REFORMATION.

By the Rev. FREDERICK GEORGE LEE, D.C.L., Vicar of All Saints', Lambeth, &c., &c. One Volume, 400 pp., Post 8vo., price 10*s.* 6*d.*

A Series of Eight Historical Sketches of the Reformation, mainly having reference to the reign of King Henry VIII. Among other subjects treated of, are the Life of Cromwell; Earl of Essex; the Pilgrimage of Grace; the destruction of the Shrine of St. Thomas-à-Becket; the murder of the Abbot of Glastonbury; and the dissolution of Sion House, Isleworth, &c. In writing these, Dr. Lee has had the opportunity of consulting several important unpublished MSS. in private hands, both at home and abroad, as well as the recently arranged English Public Records.

### THE COMMERCIAL PRODUCTS OF THE SEA; or,

Marine Contributions to Industry and Art. By P. L. SIMMONDS, Author of "The Commercial Products of the Vegetable Kingdom." One Volume, with numerous Illustrations. Price 16*s.*

### A GLOSSARY OF BIOLOGICAL, ANATOMICAL, AND

PHYSIOLOGICAL TERMS, for Teachers and Students, in Schools and Classes connected with the Science and Art Department and other Examining bodies. By THOMAS DUNMAN, Physiology Lecturer at the Birkbeck Institution and the Working Men's College. Crown 8vo., cloth, 2*s.* 6*d.*

### PASSAGES FROM THE LIFE OF A CHURCH OWL.

Related by Herself. Foolscap 8vo., sewed, price 6*d*

NEW AND STANDARD WORKS—*Continued.*

TALKS ABOUT PLANTS; or, Early Lessons in Botany. By Mrs. LANKESTER, Author of "Wild Flowers Worth Notice," "A Plain and Easy Account of British Ferns," and of the popular portion of Sowerby's English Botany. With Six Coloured Plates and Numerous Wood Engravings. Crown 8vo., cloth, gilt edges, 5*s.*

MEMORABLE BATTLES IN ENGLISH HISTORY; Where Fought, Why Fought, and their Results; with the Military Lives of the Commanders. By W. H. DAVENPORT ADAMS. New and thoroughly Revised Edition, with Frontispiece and Plans of Battles. Two volumes, crown 8vo., cloth, price 16*s.*

CHILD-LIFE IN JAPAN AND JAPANESE CHILD STORIES. By M. CHAPLIN AYRTON, (Civis Academiæ Edinensis, et Elève de la Faculté de Médicine de Paris.) With many Illustrations, including seven full-page Pictures Drawn and Engraved by Japanese Artists. Crown 4to., cloth elegant, price 10*s.* 6*d.*

THE CRIMEAN CAMPAIGN WITH THE CONNAUGHT RANGERS, 1854-55-56. By Lieut-Colonel NATHANIEL STEEVENS, late 88th (Connaught Rangers). One Volume, Demy 8vo., with Map, cloth, 15*s.*

MASTERPIECES OF ANTIQUE ART. From the Celebrated Collections in the Vatican, the Louvre, and the British Museum. By STEPHEN THOMPSON, Author of "Old English Homes," "Old Masters," &c. Twenty-five Examples in Permanent Photography. Super-Royal 4to. Elegantly bound, cloth gilt, Two Guineas.

## NEW NOVELS.

"BONNIE LESLEY;" a Novelette in One Volume. By Mrs. HERBERT MARTIN, Author of "Cast Adrift." With Frontispiece by Miss C. Paterson. Crown 8vo., cloth, 5*s.*

"A very pleasant book, and contains a decidedly interesting story."—*Athenæum.*
"There is no praise too high for Mrs. Martin's delightful story."—*Academy.*

LEFT ALONE; or, the Fortunes of Phillis Maitland. By FRANCIS CARR, Author of "Not Lancelot, nor Another." Uniform with "Bonnie Lesley." Cloth, 5*s.*

MY MOTHER'S DIAMONDS; a Domestic Story for Daughters at home. Uniform with "Bonnie Lesley." By MARIA J. GREER. With a Frontispiece by A. Ludovici. Cloth, 5*s.*

THE SECRET OF THE SANDS; or, the Water Lily and her Crew. A Nautical Novel. By HARRY COLLINGWOOD. Two Volumes, Crown 8vo., 12*s.*

JOYCE; a Novel in One Volume. By PAULINA BIDDULPH. Cloth, 10*s.* 6*d.*

"A simple chapter in the life of a young lady, prettily written."—*Daily News.*
"A pretty little cheery novelette."—*Guardian.*

THE VICAR OF WAKEFIELD; a Tale. By OLIVER GOLDSMITH. With eight Illustrations by John Absolon. Beautifully printed by Wittingham on superfine paper, 3*s.* 6*d.* Cloth. 10*s.* 6*d.* Morocco Antique.

It may not be uninteresting to state that it was from the house now occupied by Messrs. GRIFFITH AND FARRAN, that under the auspices of Mr. NEWBERY, GOLDSMITH'S friend, "The Vicar of Wakefield" was first issued. To the same publisher also belongs the distinction of having originally brought out GOLDSMITH'S celebrated poem, "The Traveller."

ASEM, AN EASTERN TALE; or, the Wisdom of Providence in the Moral Government of the World. By OLIVER GOLDSMITH. With Editor Introduction and Illustrations. 4to., cloth, 2*s.*

"Exceedingly pleasant reading . . . The illustrations are excellent."—*Bookseller.*

A JOURNEY TO THE CENTRE OF THE EARTH. From the French of JULES VERNE. With 52 Illustrations by Riou. New Edition. Pos 8vo., 6*s.*; or bevelled boards, gilt edges, 7*s.* 6*d.*

"The startling story is told with a captivating air of reality."—*Daily Telegraph.*

MISSION FROM CAPE COAST CASTLE TO ASHANTEE. With a Descriptive Account of that Kingdom. By the late T. EDWARD BOWDICH, Esq. New Edition, with Preface by his daughter, Mrs. HALE. With map of the route to Coomassie. Post 8vo., cloth, 5*s.*

"Most trustworthy and graphic."—*Standard.* "It is invaluable."—*Guardian.*

THE DAY DREAMS OF A SLEEPLESS MAN; being a series of Papers recently contributed to the *Standard*, by FRANK IVES SCUDAMORE, Esq., C.B. Post 8vo., cloth, 3*s.* 6*d.*

"Decidedly clever and full of good humour."—*Graphic.*

LECTURES ON LATIN PRONUNCIATION. By LEO DE LACY. Cloth 5*s.*

Lecture I.—The Popular View of the recent University Standard of Latin Pronunciation.

Lecture II.—The Critical View or Analysis of the same, with a Judicial Summing up, Verdict, and Substitute.

Lecture III.—On the Gerundive, the Imperative Mood, and on certain points of English Orthography.

## HISTORY AND BIOGRAPHY.

OCEAN AND HER RULERS; a Narrative of the Nations which have from the Earliest Ages held Dominion over the Sea, comprising a brief History of Navigation from the Remotest Periods up to the Present Time. By ALFRED ELWES. New, Enlarged, and thoroughly Revised Edition, with 16 Illustrations by Walter W. May. Crown 8vo., cloth, 9*s.*

"Deserving of a place on the shelves of every library."—*Naval and Military Gazette.*
"It is a privilege to read such a book."—*Art Journal.*
"Of extensive information and valuable reference."—*School Guardian.*

JOAN OF ARC AND THE TIMES OF CHARLES THE SEVENTH. By Mrs. BRAY. 7*s.* 6*d.*

"Readers will rise from its perusal not only with increased information, but with sympathies awakened and elevated."—*Times.*

## HISTORY AND BIOGRAPHY—*Continued.*

THE GOOD ST. LOUIS AND HIS TIMES. By Mrs. BRAY. With Portrait. 7*s.* 6*d.*

"A valuable and interesting record of Louis' reign."—*Spectator.*

TALES OF THE SARACENS. By BARBARA HUTTON. Illustrated by E. H. Corbould. Cloth, gilt edges, 5*s.*

TALES OF THE WHITE COCKADE. By BARBARA HUTTON. Illustrated by J. Lawson. Cloth 5*s.*; gilt edges, 5*s.* 6*d.*

"A most pleasant and well written narrative of the Stuarts in their exile."—*Times.*
"A history as romantic as any novel."—*Saturday Review.*

HEROES OF THE CRUSADES. By BARBARA HUTTON. Illustrated by P. Priolo. Cloth, gilt edges, 5*s.*

"The most romantic history of the Middle Ages, skilfully narrated for the delight and instruction of the young."—*British Quarterly.*

THE FIERY CROSS; OR, THE VOW OF MONTROSE. By BARBARA HUTTON. Illustrated by J. Lawson. Cloth, 4*s.* 6*d.* Gilt edges, 5*s.*

THE MODERN BRITISH PLUTARCH; or, Lives of Men Distinguished in the recent History of our Country for their Talents, Virtues, and Achievements. By W. C. TAYLOR, LL.D. 12mo. Second Thousand, 4*s.* 6*d.*, or gilt edges, 5*s.*

## IMPORTANT BOOKS OF FOLK-LORE.

PATRAÑAS; or, Spanish Stories, Legendary and Traditional. With Illustrations by Edward H. Corbould, 5*s.*; gilt edges, 5*s.* 6*d.*

"These Patrañas contain great beauty, as well as much that is new and curious."—*Literary Churchman.*
"Delightfully chivalrous, quaint, and truly Spanish."—*Monthly Packet.*
"Told in a lively and graphic manner."—*Times.*

SAGAS FROM THE FAR EAST; or, Kalmouk and Mongolian Tales; With Historical Preface and Explanatory Notes. By the same Author, 9*s.*

"The mere lover of good stories, and the historical and ethnological inquirer will be equally pleased with the wonderful narratives."—*Daily News.*

HOUSEHOLD STORIES FROM THE LAND OF HOFER; or, Popular Myths of Tirol, including the Rose Garden of King Laryn. By the same Author. With Illustrations by T. Green, cloth, gilt edges, 5*s.*

"We thank the author of 'Patrañas' for another rich treat."—*Art Journal.*
"A collection of charming legends, all of them interesting, and some of them exquisitely beautiful."—*Scotsman.*

TALES AND LEGENDS OF SAXONY AND LUSATIA, By W. WESTALL. Illustrated by H. W. Petherick, 4*s.* 6*d.*; gilt edges, 5*s.*

"They contain some curious superstitions and legendary lore."—*Academy.*
"The tales are imaginative and striking narratives, in which the supernatural is quaintly blended with homely scenes of German life."—*Daily News.*

BASQUE LEGENDS. Collected chiefly in the Labourd. By the Rev. WENTWORTH WEBSTER, M.A., Oxon.; With an Essay on the Basque Language by M. JULES VINSON, of the Revue de Linguistique, Paris. Demy 8vo., gilt edges, cloth, 7*s.* 6*d.*

"A most interesting book."—*Nature.*

## USEFUL KNOWLEDGE AND ENTERTAINING ANECDOTE.

THE FOUR SEASONS; A Short Account of the Structure of Plants, being Four Lectures written for the Working Men's Institute, Paris. With Illustrations. Imperial 16mo., 3*s.* 6*d.*

"Distinguished by extreme clearness, and teems with information of a useful and popular charactcr."—*Guardian.*

TREES, PLANTS, AND FLOWERS, Their Beauties, Uses, and Influences. By Mrs. R. LEE. With Coloured Groups of Flowers, from Drawings by James Andrews. Second Thousand. 8vo., cloth, gilt edges, 10*s.* 6*d.*

EVERY-DAY THINGS; or, Useful Knowledge respecting the Principal Animal, Vegetable, and Mineral Substances in Common Use. Second Edition, revised, 18mo., cloth, 1*s.* 6*d.*

INFANT AMUSEMENTS; or, How to make a Nursery Happy. With Practical Hints to Parents and Nurses on the Moral and Physical Training of Children. Post 8vo., cloth, 3*s.* 6*d.*

CONTENTS.—How to Make a Nursery Happy. The Nursery Gymnasium. Games to Afford Exercise. Amusements and Employments requiring Materials or Toys. Out-of-Door Games. In-door Games. Toys. Tales. Songs with Music. How to make the Sunday Happy. Prayers and Hymns for very Little Children. Hymns and Sacred Poetry set to Music. Remedies to be used in case of Accidents.

"It ought to be in the hands of every mother and governess."—*Art Journal.*
"It is a *multum in parvo*—each chapter is worth the price of the book."—*Our Own Fireside.*

FEMALE CHRISTIAN NAMES AND THEIR TEACHINGS. By MARY E. BROMFIELD. Beautifully printed on Toned Paper. Imp. 32mo., cloth, gilt edges, 1*s.* 6*d.*; French Morocco, 2*s.* 6*d.*; Calf or Morocco, 4*s.* 6*d.*

FAMILIAR NATURAL HISTORY; with descriptions by Mrs. R. LEE, and forty-two Illustrations by Harrison Weir. Cloth, 3*s.* 6*d.*, or Coloured plates, gilt edges, 5*s.*

OUR SAILORS; or, Anecdotes of the Engagements and Gallant Deeds of the British Navy. By W. H. G. KINGSTON. With Frontispiece. Eighth Thousand. New and Revised Edition. Fcap. 8vo. Cloth, 3*s.*; gilt edges, 3*s.* 6*d.*

"These little chronicles are worthy to be placed in a boy's hands, who can read of few better subjects than brave and gallant actions performed under the influence of discipline and judgment."—*Times.*

OUR SOLDIERS; or, Anecdotes of the Campaigns and Gallant Deeds of the British Army during the Reign of Her Majesty Queen Victoria. By W. H. G. KINGSTON. With Frontispiece. Eighth Thousand. New and Revised Edition. Fcap. 8vo., cloth, 3*s.*; gilt edges, 3*s.* 6*d.*

"The gallant deeds are pleasantly and gallantly told."—*Edinburgh Daily Review.*

ANECDOTES OF THE HABITS AND INSTINCTS OF ANIMALS. By Mrs. R. LEE. Illustrated by Harrison Weir. Fifth Edition. Post 8vo., cloth, 3*s.* 6*d.*, or gilt edges, 4*s.*

ANECDOTES OF THE HABITS AND INSTINCTS OF BIRDS, REPTILES, AND FISHES. By Mrs. R. LEE. Illustrated by Harrison Weir. Fourth Edition. Post 8vo., cloth, 3*s.* 6*d.*; gilt edges, 4*s.*

## WORKS BY THE LATE JOHN TIMBS, F.S.A.

ANCESTRAL STORIES AND TRADITIONS OF GREAT FAMILIES. Illustrative of English History. With Frontispiece, cloth, 7*s.* 6*d.*

"An interesting and well-written book."—*Literary Churchman.*

NOTABILIA; or, Curious and Amusing Facts about many things. Explained and Illustrated. Post 8vo., 6*s.*

"There is a world of wisdom in this book."—*Art Journal.*

STRANGE STORIES OF THE ANIMAL WORLD; a Book of Curious Contributions to Natural History. Second Edition. With Illustrations by Zwecker, gilt edges, 6*s.*

"Will be studied with profit and pleasure."—*Athenæum.*

---

## STANESBY'S ILLUMINATED GIFT BOOKS.

Every Page richly Printed in Gold and Colours.

THE BRIDAL SOUVENIR. New Edition. With a Portrait of the Princess Royal. Elegantly bound in white morocco, 21*s.*

"A splendid specimen of the decorative art, and well suited for a bridal gift."

THE BIRTH-DAY SOUVENIR. A Book of Thoughts on Life and Immortality. 12*s.* 6*d.* cloth; 18*s.* morocco antique.

LIGHT FOR THE PATH OF LIFE; from the Holy Scriptures. Small 4to., 12*s.* cloth; 15*s.* calf, gilt edges; 18*s.* morocco antique.

THE WISDOM OF SOLOMON; from the Book of Proverbs. Small 4to., 14*s.* cloth elegant; 18*s.* calf; 21*s.* morocco antique.

THE FLORAL GIFT. 14*s.* cloth elegant; 21*s.* morocco extra.

SHAKESPEARE'S HOUSEHOLD WORDS. With a Photograph from the Monument at Stratford-on-Avon. New and Cheaper Edition. 6*s.* cloth elegant; 10*s.* 6*d.* morocco antique.

"An exquisite little gem, fit to be the Christmas offering to Titania or Queen Mab."

APHORISMS OF THE WISE AND GOOD. With a Photographic Portrait of Milton. 6*s.* cloth elegant; 10*s.* 6*d.* morocco antique.

---

CAXTON'S FIFTEEN O'S AND OTHER PRAYERS

Printed by command of the Princess Elizabeth, Queen of England and France, and also o the Princess Margaret, mother of our Sovereign Lord the King. By WM. CAXTON. Reproduced in Photo-Lithography by S. Ayling. Quarto, bound in parchment. New and Cheaper Edition, 6*s.*

## THE BOOK OF REMEMBRANCE FOR EVERY DAY

in the Year. Containing Choice Extracts from the Best Authors, and the exact place indicated whence the Quotation is taken, with Blank Spaces for recording Birthdays, Marriages, and other Anniversaries. Beautifully printed in red and black. Imperial 32mo.

"A charming little memorial of love and friendship, and happily executed as conceived. For a birthday, or other Anniversary nothing can be prettier or more appropriate."—*Bookseller.*
"Beautifully got up."—*Leeds Mercury.*

*May be had in the following Styles of Binding:—*

| | s. | d. | | s. | d. |
|---|---|---|---|---|---|
| Cloth Elegant, bevelled boards, gilt edges | 2 | 6 | Calf or Morocco, limp, red under gold edges | 5 | 0 |
| French Morocco, limp, gilt edges | 3 | 6 | Morocco, bevelled boards, do. | 7 | 6 |
| Persian Morocco, bevelled boards, red under gold edges | 4 | 6 | Ditto, with gilt clasp | 8 | 6 |
| Ditto, with clasp | 5 | 0 | Russia, limp, elegant, do. | 10 | 0 |

*With Twelve Beautiful Photographs.*

| | s. | d. | | s. | d. |
|---|---|---|---|---|---|
| Cloth, Elegant | 5 | 0 | Russia, limp, extra | 15 | 0 |
| Calf or Morocco, limp | 10 | 0 | Levant Morocco, elegant | 18 | 0 |
| Morocco, bevelled | 12 | 6 | | | |

## ANNIVERSARY TEXT BOOK; a Book of Scripture Verse

and Sacred Song for Every Day in the Year. Interleaved.

*May be had in the following Styles of Binding:—*

| | s. | d. | | s. | d. |
|---|---|---|---|---|---|
| Cloth, bevelled boards, white edges | 1 | 0 | Persian Morocco, limp, circuit, or tuck edges | 3 | 0 |
| ,, gilt ,, gilt ,, | 1 | 6 | Morocco, rims | 3 | 0 |
| ,, ,, ,, ,, rims | 2 | 0 | Morocco, elegant, rims | 4 | 6 |
| French Morocco, limp | 2 | 0 | Morocco, bevelled, and clasp | 4 | 6 |
| Calf or Morocco, ,, | 2 | 6 | Russia, limp, red under gold edges | 4 | 6 |
| Imitation Ivory, rims | 3 | 0 | Ivory, rims | 7 | 6 |

## NEW POETRY.

## THE SEASONS; a Poem by the Rev. O. RAYMOND, LL.B.,

Author of "The Art of Fishing on the Principle of Avoiding Cruelty," "Paradise," and other Poems. Fcap. 8vo., with Four Illustrations. Cloth, 2*s.* 6*d.*

## POEMS. By E. L. FLOYER. Fcap. 8vo., Cloth, 2*s.* 6*d.*

"There is undoubtedly a certain charm in her lines from their graceful and melodious flow, and the pathetic earnestness which animates them."—*Saturday Review.*
"Give evidence of a good ear of great sensibility and of some imagination—genuine poetry."—*Graphic.*
"Some of the little character sketches indicate a good deal of talent."—*John Bull.*
"Shows no little power."—*Spectator.*

## DEVOTIONAL AND RELIGIOUS BOOKS.

EMBLEMS OF CHRISTIAN LIFE. Illustrated by Harry Rogers, in One Hundred Original Designs, from the Writings of the Fathers, Old English Poets, &c. Printed by Whittingham, with Borders and Initials in Red. Square 8vo., 10*s.* 6*d.* cloth elegant, gilt edges; 21*s.* Turkey Morocco Antique.

"This splendid book is a marvel of beautiful drawing and printing. The emblems have been so grouped as to give, as far as possible, one consecutive series of thoughts."—*Literary Churchman.*

"A book full of deep thought, and beautiful, yet quaint, artistic work."—*Art Journal.*

"Printed throughout in black letter, with red initial letters, it is by far the most complete and beautiful specimen we ever have seen."—*Examiner.*

---

BISHOP KEN'S APPROACH TO THE HOLY ALTAR. With an Address to Young Communicants. New and Cheaper Edition.

| | *s.* | *d.* | | *s.* | *d.* |
|---|---|---|---|---|---|
| Limp cloth ... ... ... ... ... ... | 0 | 8 | Calf or Morocco, limp ... .. ... | 3 | 6 |
| Superior cloth, red edges ... ... ... | 1 | 0 | Morocco, bevelled ... ... ... ... | 4 | 6 |
| French Morocco, limp ... ... ... | 1 | 6 | Russia, limp ... ... ... ... ... | 4 | 6 |

*With Photographs, 2s. extra.*

*** Clergymen wishing to introduce this Manual can have Specimen Copy, with prices for quantities, post free for six stamps on application.

AN ILLUMINATED CERTIFICATE OF CONFIRMATION AND FIRST COMMUNION. Printed in gold and colours, size 6 × 4½ inches. Price 2*d.*

THE NEW "IN MEMORIAM" CARD. Beautifully printed in silver or gold. Price 2*d.*

*** *A reduction made on taking a quantity of the above cards.*

---

THE PRACTICAL CHRISTIAN'S LIBRARY. A Box containing Nine Books, bound in Satin Cloth, red edges, 18*s.*; or in French Morocco, 25*s.* Size of Box, 7 × 6½ × 4½, with full gilt top.

CONTENTS—

**Imitation of Christ.** A'KEMPIS.

**St. Augustine's Confessions.**
**Bishop Taylor's Holy Living.**
**" " Holy Dying.**
**Bishop Ken's Manual of Prayer.**
**Bishop Wilson's Lord's Supper.**
**" " Sacra Privata.**
**Sherlock's Meditations.**
**" Self Examinations.**

Any of the Volumes may be had separately 2*s.* each in cloth, or 2*s.* 6*d.* each, French Morocco.

DEVOTIONAL AND RELIGIOUS BOOKS.—*Continued.*

WORDS OF ANTHEMS FOR USE IN ST. PAUL'S CATHEDRAL. Edited by the Rev. W. RAYSON, M.A., Vicar of Lindridge, Tenbury; JOHN STAINER, M.A., Mus. Doctor, Organist of St. Paul's; and Rev. J. TROUTBECK, M.A., Priest in Ordinary to the Queen, and Minor Canon of Westminster. Cloth, red edges, 3*s.* 6*d.*; French Morocco, 5*s.*

THE WAY OF PRAYER, a Book of Devotions, for use in Church and at Home. Compiled by Rev. H. W. MILLER, M.A., Senior Curate of Richmond, Surrey. Second Edition. Cloth, red edges, 1*s.*

HINTS TO A CLERGYMAN'S WIFE, or Female Parochial Duties Practically Illustrated. Third Edition revised. Cloth, 2*s.*

DR. LEE'S ALTAR SERVICES. Edited by the Rev. Dr. F. G. LEE, D.C.L., F.S.A. Containing the complete Altar Services of the Church, beautifully printed in Red and Black at the Chiswick Press, enriched with Ornamental Capitals, &c., in Three Volumes; One Volume, folio size, 15 × 10 × 1½ inches; and Two Volumes 4to., containing the Epistles and Gospels separately, each 12 × 9 × ¾ inches.

The Set, in Turkey Morocco, plain ... ... £7 7 0
,, Best Levant Morocco, inlaid cross ... £10 10 0

The Folio Volume, which contains all the Services of the Altar, may be had separately—
Turkey Morocco, plain ... ... ... ... £3 3 0
Best Levant Morocco, inlaid cross ... ... £4 4 0

*** The work can also be bound specially to order in cheaper or more expensive styles.

Messrs. GRIFFITH AND FARRAN have a few copies remaining of this rare and valuable work, which is not only the best book for the purpose for which it is designed, but is one of the finest specimens of typographical art which the Chiswick Press has produced.

---

BIBLES from One Shilling.

PRAYER BOOKS from Sixpence.

CHURCH SERVICES from One Shilling.

---

**Hymns Ancient and Modern, Books of Private and Family Prayer, &c., &c.**

Agents for the CHURCH HYMNAL published by the Association for Promoting Christian Knowledge, Dublin.

*A Descriptive Catalogue with Specimens of Types post free.*

N.B.—A considerable reduction made to Schools and others purchasing quantities.

## WORKS FOR DISTRIBUTION.

A WOMAN'S SECRET; or, How to Make Home Happy. Thirty-Third Thousand. 18mo., sewed, 6*d.*

By the same Author, uniform in size and price.

WOMAN'S WORK; or, How she can Help the Sick. 19th Thousand.

A CHAPTER OF ACCIDENTS; or, the Mother's Assistant in Cases of Burns, Scalds, Cuts, &c. Tenth Thousand.

PAY TO-DAY, TRUST TO-MORROW; illustrating the Evils of the Tally System. Seventh Thousand.

NURSERY WORK; or, Hannah Baker's First Place. Fifth Thousand.

---

THE COOK AND THE DOCTOR; or, Cheap Recipes and Useful Remedies. Selected from the three first books. Sewed, 2*d.*

HOME DIFFICULTIES. A few Words on the Servant Question. Sewed, 4*d.*

FAMILY PRAYERS FOR COTTAGE HOMES, with Passages from the Scriptures. Sewed, 2*d.*

---

TAKING TALES FOR COTTAGE HOMES. Edited by W. H. G. KINGSTON. In 4 Vols., crown 8vo., each containing Three Tales, cloth extra, 1*s.* 6*d.* each. In 2 Vols., crown 8vo., each containing Six Tales, cloth extra, bevelled boards, 3*s.* 6*d.* each. Each Tale may be had separate in paper covers, 4*d.*

LIST OF SUBJECTS.

1. **The Miller of Hillbrook**; a Rural Tale.
2. **Tom Trueman**, a Sailor in a Merchantman.
3. **Michael Hale and his Family in Canada.**
4. **John Armstrong, the Soldier.**
5. **Joseph Rudge**, the Australian Shepherd.
6. **Life Underground**; or, Dick, the Colliery Boy.
7. **Life on the Coast**; or, the Little Fisher Girl.
8. **Adventures of Two Orphans in London.**
9. **Early Days on Board a Man-of-War.**
10. **Walter the Foundling**; a Tale of Olden Times.
11. **The Tenants of Sunnyside Farm.**
12. **Holmwood**; or the New Zealand Settler.

The object of this Series is to supply the cottagers and humbler classes of England, whose knowledge of reading and whose vocabularies are limited, with books in clear large type, composed of words the meaning of which they understand, sentences which the eye can take in with ease, ideas suited to their comprehension, on subjects likely to excite their interest, so that they may obtain amusement and wholesome instruction without the labour which a large number of the works at present put into their hands demands.

The series will be found suitable for the poorer population of our towns, the inhabitants of our coasts, and our Soldiers and Sailors in barracks and on board ship; also for reading in night schools, and for parish Libraries.

# Educational Works.

## GOOD HANDWRITING.

GEORGE DARNELL'S COPY-BOOKS after over a quarter of a century of public favour are everywhere acknowledged as the best for simplicity and thoroughness. With these Copy-Books the pupil advances in the art of writing with ease and rapidity, while the labour of the teacher is very greatly lightened. They are used in nearly all the best Schools in Great Britain and the Colonies, and are adapted to the New Educational Code.

The first Ten Numbers of each Series have on every alternate line appropriate and carefully written copies in *pencil coloured ink*, to be first written over and then imitated, the remaining numbers having two copies on each page *in black ink* for imitation only.

### ADVANTAGES OF THE SYSTEM.

I. It is the production of an experienced Schoolmaster.
II. It gradually advances from the Simple Stroke to the superior Small Hand.
III. The assistance given in the Primal Lesson is reduced as the learner progresses, until all guidance is safely withdrawn.
IV. The number and variety of the copies secure attention, and prevent the pupils copying their own writing, as in books with single head-lines.
V. The system insures the progress of the learner, and greatly lightens the labours of the teacher.

A SHORT AND CERTAIN ROAD TO A GOOD HANDWRITING. LARGE POST. 16 Nos., *6d.* each. Being a Series of SIXTEEN COPY BOOKS, by GEORGE DARNELL, the first ten of which have on every alternate line appropriate and carefully written copies in Pencil-coloured Ink, to be first written over and then imitated, the remaining numbers having Black Head-lines for imitation only, THE WHOLE GRADUALLY ADVANCING FROM A SIMPLE STROKE TO A SUPERIOR SMALL HAND.

No.
1. Elementary (Strokes, &c.).
2. Single Letters.
3, 4. Large Text (Short Words).
5. Text, Large Text, and Figures.
6. Round Text, Capitals and Figures.
7. Text, Round, and Small.
8, 9, 10. Text, Round, Small, and Figures.
11, 12. Round, Small, and Figures.
13, 14. Round and Small.
15, 16. Small Hand.

A SURE GUIDE TO A GOOD HANDWRITING. A Series of TWENTY-FOUR COPY BOOKS, on a similar plan. Oblong Foolscap. 24 Nos., *3d.* each, green covers; Or on a superior paper, marble covers, *4d.* each.

No.
1. Elementary (Strokes, &c.).
2. Single Letters.
3, 4. Large Text (Short Words).
5. Text, Large Text, and Figures.
6. Text, Round, and Capitals.
7. Round, Small, and Figures.
8. Text, Round, and Small.
9. Round, Small, and Figures.
10, 11. Round and Small.
12, 13, 15. Round, Small, and Figures.
14. Round and Small.
16 to 20. Small Hand.
21. Ornamental Hands.
22 to 24. Ladies' Angular Writing.

## DARNELL'S COPY BOOKS.—*Continued.*

UNIVERSAL COPY BOOKS. A Series of Sixteen Copy Books, on the same Plan. Fcap. 4to., *2d.* each.

| No. | | No. | |
|---|---|---|---|
| 1. | Elementary. | 7. | Text, Round, and Small. |
| 2. | Single and Double Letters. | 8, 9, 10. | Text, Round, Small, and Figures. |
| 3, 4. | Large Text (Short Words). | 11, 12. | Round, Small, and Figures. |
| 5. | Text, Large Text, and Figures. | 13, 14. | Round and Small. |
| 6. | Text, Round, Capitals, and Figures. | 15, 16. | Small Hand. |

"For teaching writing I would recommend the use of Darnell's Copy Books. I HAVE NOTICED A MARKED IMPROVEMENT WHEREVER THEY HAVE BEEN USED."—*Report of Mr. Maye (National Society's Organiser of Schools) to the Worcester Diocesan Board of Education.*

"As to the necessity of some one proposing a new way to teach writing, I do not think it is needed. Let a London Clerk inspect one of Mr. Darnell's Copy Books (I believe they are most generally in use in our schools), and I think he will say that, with a moderate amount of care on the part of the teacher, THE RESULT MUST BE A LEGIBLE, CLEAR HAND-WRITING."—*An Essex Schoolmaster; National Society's Monthly Paper.*

The *Times* says: "This gentleman has conferred a great benefit, not only on the rising generation, but on those who will hereafter form the rising generation. He has composed a series of Elementary Treatises, in which the comprehension of the art or science taught is so much facilitated that children of the dullest capacities are made capable of comprehending what is required of them, whilst teachers are relieved from the difficulties of imparting knowledge in the desultory and incomprehensible manner too often practised."

## HISTORY.

BRITANNIA; A Collection of the Principal Passages in Latin Authors that refer to this Island, with Vocabulary and Notes. By T. S. CAYZER. Illustrated with a Map and 29 Woodcuts. Crown 8vo., cloth, *3s. 6d.*

"A very useful book."—*School Board Chronicle.*
"The task is admirably done."—*School Guardian.*
"A most attractive Latin reading book, and as useful as it is attractive."—*Edinburgh Daily Review.*

TRUE STORIES FROM ANCIENT HISTORY, Chronologically arranged from the Creation of the World to the Death of Charlemagne. Twelfth Edition. 12mo., *5s.* cloth.

BATTLE FIELDS; a graphic Guide to the Places described in the History of England as the Scenes of such Events; with the situation of the principal Naval Engagements fought on the Coast. By Mr. WAUTHIER, Geographer. On a Large Sheet, *3s. 6d.*; or on a Roller, and Varnished, *7s. 6d.*

MRS. TRIMMER'S CONCISE HISTORY OF ENGLAND. Revised and brought down to the Present Time. By Mrs. MILNER. With Portraits of the Sovereigns. *5s.* cloth.

RHYMES OF ROYALTY; the History of England in Verse from the Norman Conquest to the Reign of Victoria; with a Summary of the Leading Events in each Reign. Fcap. 8vo., *2s.* cloth.

## GEOGRAPHY.

Cheap Re-Issue of

PICTORIAL GEOGRAPHY, for the Instruction of Children. Illustrates at a glance the Various Geographical Terms in such a manner as to at once impart clear and definite ideas respecting them. On a Sheet 30 by 22 inches, Printed in Colours, 1*s.* 6*d.*; Mounted on Rollers and Varnished, 3*s.* 6*d.*

"A pretty and picturesque wall chart . . . . Forms an excellent introduction to the Study of Maps."—*School Board Chronicle.*

"Will be a great help to children learning Geography."—*Scholastic World.*
"A valuable and attractive help to the teaching of the Elements of Geography."—*Nature.*
"Admirably suited for teaching the meaning of common Geographical Terms."—*School Guardian.*

THE FIRST BOOK OF GEOGRAPHY; specially adapted as a Text-Book for Beginners. By HUGO REID. Fourth Edition, Revised. 18mo., sewed, 1*s.*

"One of the most sensible little books on the subject of Geography we have met with."—*Educational Times.*

GAULTIER'S FAMILIAR GEOGRAPHY. With a Concise Treatise on the Artificial Sphere, and Two coloured Maps, illustrative of the principal Geographical Terms. Sixteenth Edition. 16mo., cloth, 3*s.*

BUTLER'S OUTLINE MAPS, AND KEY, or Geographical and Biographical Exercises; With a Set of Coloured Outline Maps, designed for the use of Young Persons. By the late WILLIAM BUTLER. Enlarged by the Author's Son, J. O. BUTLER. Thirty-sixth Edition, Revised to date. 4*s.*

TABULAR VIEWS OF THE GEOGRAPHY AND SACRED HISTORY OF PALESTINE, AND OF THE TRAVELS OF ST. PAUL. Intended for Pupil Teachers, and others engaged in Class Teaching. By A. T. WHITE. Oblong 8vo., 1*s.* sewed.

## GRAMMAR, &c.

A COMPENDIOUS GRAMMAR AND PHILOLOGICAL HANDBOOK OF THE ENGLISH LANGUAGE, for the Use of Schools and Candidates for the Army and Civil Service Examinations. By JOHN GEORGE COLQUHOUN, Esq., Barrister-at-Law. Fcap. 8vo., cloth, 2*s.* 6*d.*

DARNELL, G. GRAMMAR MADE INTELLIGIBLE TO CHILDREN. Being a Series of Short and Simple Rules, with ample Explanations of Every Difficulty, and copious Exercises for Parsing; in Language adapted to the comprehension of very young Students. New and Revised Edition. Cloth, 1*s.*

DARNELL, G. INTRODUCTION TO ENGLISH GRAMMAR. Price 3*d.* Being the first 32 pages of "Grammar made Intelligible."

DARNELL, T. PARSING SIMPLIFIED; an Introduction and Companion to all Grammars; consisting of Short and Easy Rules, with Parsing Lessons to each. Fourth Edition. Cloth, 1*s.*

GRAMMAR, &c.—*Continued.*

LOVECHILDS, MRS. THE CHILD'S GRAMMAR. 50th Edition. 18mo., cloth, 9*d.*

A WORD TO THE WISE; or, Hints on the Current Improprieties of Expression in Writing and Speaking. By PARRY GWYNNE. Thirteenth Thousand. 18mo., sewed 6*d.*, or cloth, gilt edges, 1*s.*

"All who wish to mind their *p's* and *q's* should consult this little volume."—*Gentleman's Magazine.*

HARRY HAWKINS'S H-BOOK; showing how he learned to aspirate his H's. Frontispiece by H. Weir. Third Edition. Super-royal 16mo., sewed, 6*d.*

"No family or schoolroom within, or indeed beyond the sound of Bow bells, should be without this merry manual."
—*Art Journal.*

THE PRINCE OF WALES'S PRIMER. With 340 Illustrations by J. Gilbert. New Edition. Sewed, 6*d.*

DARNELL, G. SHORT AND CERTAIN ROAD TO READING. Being a Series of EASY LESSONS in which the Alphabet is so divided as to enable the Child to read many Pages of Familiar Phrases before he has learned half the letters. Cloth, 6*d.*; or in 4 parts, paper covers, 1½*d.* each.

SHEET LESSONS, being Extracts from the above, printed in very large bold type. Price, for the set of Six Sheets, 6*d.*; or, neatly mounted on boards, 3*s.*

## ARITHMETIC, ALGEBRA, & GEOMETRY.

DARNELL, G. ARITHMETIC MADE INTELLIGIBLE TO CHILDREN. Being a Series of GRADUALLY ADVANCING EXERCISES, intended to employ the Reason rather than the Memory of the Pupil; with ample Explanations of every Difficulty, in Language adapted to the comprehension of very young Students. Cloth, 1*s.* 6*d.*

*** This work may be had in Three Parts:—Part I., price 6*d.* Part II., price 9*d.* Part III., price 6*d.* A KEY to Parts II. and III., price 1*s.* (Part I. does not require a Key.)

CAYZER, T. S. ONE THOUSAND ARITHMETICAL TESTS; or, THE EXAMINER'S ASSISTANT. Specially adapted, by a novel arrangement of the subject, for Examination Purposes, but also suited for general use in Schools. By T. S. CAYZER, Head Master in Queen Elizabeth's Hospital, Bristol. Eleventh Thousand. With a complete set of Examples and Models of Work. Cloth, 1*s.* 6*d.*

All the operations of Arithmetic are presented under Forty Heads, and on opening at any one of the examination papers, a complete set of examples appears, carefully graduated.

KEY WITH SOLUTIONS OF ALL THE EXAMPLES IN THE ONE THOUSAND ARITHMETICAL TESTS. By THOMAS S. CAYZER. Price 4*s.* 6*d.* cloth.

THE ANSWERS only, price 1*s.* 6*d.* cloth.

ARITHMETIC, ALGEBRA, AND GEOMETRY.—*Continued.*

ONE THOUSAND ALGEBRAICAL TESTS; on the same Plan. By THOMAS S. CAYZER. Third Edition. 8vo., cloth, 2*s.* 6*d.*

ANSWERS TO THE ALGEBRAICAL TESTS, 2*s.* 6*d.* cloth.

THEORY AND PRACTICE OF THE METRIC SYSTEM OF WEIGHTS AND MEASURES. By Professor LEONE LEVI, F.S.A., F.S.S. Third Edition. Sewed, 1*s.*

THE ESSENTIALS OF GEOMETRY, PLANE AND SOLID, as Taught in Germany and France. For Students preparing for Examination, Cadets in Naval and Military Schools, Technical Classes, &c. By J. R. MORELL, formerly one of Her Majesty's Inspectors of Schools. With numerous Diagrams. Cloth, 2*s.*

## ELEMENTARY FRENCH AND GERMAN WORKS.

LE BABILLARD; an Amusing Introduction to the French Language. By a FRENCH LADY. Ninth Edition. 16 Plates. Cloth, 2*s.*

LES JEUNES NARRATEURS; ou, Petits Contes Moraux. With a Key to the Difficult Words and Phrases. Third Edition. 18mo., cloth, 2*s.*

"Written in pure and easy French."—*Morning Post.*

THE PICTORIAL FRENCH GRAMMAR. For the Use of Children. Forming a most Pleasant and Easy Introduction to the Language. By MARIN DE LA-VOYE. With 80 Illustrations. Fcap. 8vo., cloth, 1*s.* 6*d.*

*The School Board Chronicle* says of this New Edition :—"An introductory French book, which is at the same time a child's picture book, full of woodcuts to tempt the infant's attention to the text. There are dogs, birds, boats, animals, or children on almost every page, generally with a French and English inscription under them. . . .

"Whoever wishes to introduce his pupils to French at a very tender age, would do well to begin with the 'Pictorial Grammar.'"

FRENCH VERBS, being a help to those who are Studying the French Language, in which the Irregular Verbs are fully conjugated with their respective auxiliaries. By LOUIS AMELIE ALBIGÈS. Boards, 2*s.*

ROWBOTHAM'S NEW AND EASY METHOD OF LEARNING THE FRENCH GENDERS. New Edition, sewed, 6*d.*

BELLENGER'S FRENCH WORD AND PHRASE BOOK; containing a Select Vocabulary and Dialogues. New Edition. Cloth limp, 1*s.*

DER SCHWÄTZER; or, The Prattler. An Amusing Introduction to the German Language. Sixteen Illustrations. Cloth, 2*s.*

## NEEDLEWORK, &c., AS REQUIRED BY THE NEW EDUCATIONAL CODE.

*New Work by the author of "Plain Needlework" and "Plain Knitting."*

### PLAIN CUTTING OUT FOR STANDARDS IV., V., and VI., as now required by the Government Educational Department.

By the EXAMINER OF NEEDLEWORK TO THE SCHOOL BOARD FOR LONDON. Adapted to the Principles of Elementary Geometry. Sewed 1*s.*

### A SET OF THE DIAGRAMS REFERRED TO IN the Book may be had separately, printed on stout paper and inclosed in an envelope, 1*s.*

"An invaluable little book; has mastered the most difficult branch in the needle-work department."—*Queen.*
"A great aid . . . of great service to all instructors, whether in select ladies' seminaries, board schools, large families, or home schoolrooms."—*Bazaar.*
"Full of valuable information."—*Scholastic World.*

By the same Author.

### PLAIN NEEDLEWORK ARRANGED IN SIX STANDARDS, with Hints for the Management of Classes, and Appendix on Simultaneous Teaching. Fifteenth Thousand. Sewed 6*d.*

### PLAIN KNITTING AND MENDING, ARRANGED in Six Standards, with Diagrams. Eighth Thousand. Sewed, 6*d.*

*** *These works are recommended in the published Code of the Educational Department.*

### NEEDLEWORK DEMONSTRATION SHEETS.

Messrs. GRIFFITH & FARRAN have the pleasure to announce that they have a series of the above, which exhibit certain Stitches in elementary Needlework, in preparation for use in classes. They are designed under the superintendence of the Examiner of Needlework for the School Board for London, author of the very popular manuals on the subject named above. The size of the Sheets will be about 30 × 22 inches, and the following are nearly ready :—

| | |
|---|---|
| Alphabets for Marking ... ... ... ... ... | 6 Sheets. |
| True Marking Stitch ... ... ... ... ... | 1 ,, |
| Stocking Web Stitch ... ... ... ... ... | 1 ,, |
| Grafting Stocking Material ... ... ... ... | 1 ,, |
| Herring Bone ... ... ... ... ... ... ... | 1 ,, |
| Fisherman's Stitch for Braiding Nets ... ... | 1 ,, |

Other Stitches will be added of which further particulars will be announced.

### DEMONSTRATION FRAMES for CLASS TEACHING,

With Special Needles and Cord to use with the Frames, can also be supplied.

---

### ARTIZAN COOKERY AND HOW TO TEACH IT.

By a Pupil of the National Training School for Cookery, South Kensington. Sewed, 6*d.*

"Whoever wants to promote a knowledge of cheap and wholesome cookery among the poor would do well to read this little book."—*School Board Chronicle.*
"A really practical little book."—*Bookseller.*

---

GRIFFITH AND FARRAN,
*WEST CORNER* OF ST. PAUL'S CHURCHYARD, LONDON.